The Business Magazine for Makers & Users of Chemicals

Management, Research, Production, Marketing

CHEMICAL INDUSTRIES

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Volume 48 Number 6

JUNE, 1941

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J. V. N. Dorr
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Walter S. Landis
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COMMERCIAL SODIUM CHLORITE

New Bleach Produces High Whites... With Zero Loss in Tensile Strength!

MATHIESON SODIUM CHLORITE
$NaClO_2$

1. A flaked, semi-crystalline product.
2. Light tan in color.
3. Extremely soluble in water—40% by weight at normal temperatures.
4. Stable up to and including 150 degrees C.
5. Oxidizing power equivalent to 130% available chlorine.
6. Non-hygroscopic.

● Mathieson, traditional leader in the manufacture of bleaching materials, pioneers again in presenting an entirely new bleaching agent—Commercial Sodium Chlorite ($NaClO_2$). With this new product it is possible to bleach to a high degree of whiteness *without loss in tensile strength.*

Under present everyday bleaching methods some loss in tensile strength usually results. The best that can be done is to keep this loss to a minimum while obtaining a satisfactory bleach. But *now* you can use Mathieson Sodium Chlorite which *cannot injure* cellulose fibres no matter how concentrated the bleach solution or how high the temperature of the bleaching operation.

Sodium chlorite, a development of the Mathieson research department, is unique. It is the *only* dry sodium compound containing chlorine available for general bleaching work . . . 130% available chlorine, 30% more than pure chlorine itself. Extremely soluble in water, it is very stable, non-hygroscopic. It bleaches and oxidizes in acid *or* alkaline solutions—is now being used successfully in treating textiles, paper pulp, starch, straw, and other materials.

For example—in paper mills, it is being used for bleaching on the acid side and producing pulp of high quality which is supplanting Scandinavian. In textile mills it permits bleaching on the acid side without degrading the fabric. Textile mills add chlorite to the kiers, eliminating multiple boils and increasing capacity of existing equipment . . . equipment which has become doubly important in times of heavy production such as these.

In all of these applications sodium chlorite is remarkably economical. Because of its unique *selective* action, which enables it to bleach without loss in tensile strength, every pound of sodium chlorite does useful work. Because of its high stability, none is dissipated and wasted in the process. Thus, bleaching with sodium chlorite means not only a better product and increased plant capacity, but more economical production as well.

Drop us a line today for complete information on sodium chlorite. Our technical staff, the men who developed this amazing new product, will be glad to sit down with you and discuss how Mathieson Sodium Chlorite can help you with your bleaching problems.

MATHIESON CHEMICALS

THE MATHIESON ALKALI WORKS (INC.)
60 E. 42ND STREET, NEW YORK, N. Y.

SODIUM CHLORITE PRODUCTS . . . SODA ASH . . . CAUSTIC SODA . . . BICARBONATE OF SODA . . . LIQUID CHLORINE . . . BLEACHING POWDER . . . HTH PRODUCTS . . . AMMONIA, ANHYDROUS and AQUA . . . FUSED ALKALI PRODUCTS . . . SYNTHETIC SALT CAKE . . . DRY ICE . . . CARBONIC GAS

The Reader Writes—

Editorial Note: Below are comments on the suggestion of Werner W. Baumeister, American Chemical and Oil Products Co., advocating the standardization of the size of the advertising literature of chemical companies.

From a Director of Research

I showed this suggestion to our librarian and secretary and both of them thought the idea a grand one. They agree quite whole-heartedly with Mr. Baumeister.

DR. H. L. FISHER,
Director of Organic Research,
U. S. Industrial Chemicals, Inc.,
Stamford, Conn.

From a Purchasing Agent

I am heartily in accord with the suggestions offered by Mr. Baumeister. However, the question arises in my mind as to whether it would warrant the increased expense so far as the supplier is concerned. I think it would offer immeasurable benefits to the customer providing the supplier can be convinced that it will pay to adopt such a system. Furthermore, this method of submitting data would have to be universal in order to be effective.

ROBERT P. GOULD,
Purchasing Agent,
Heyden Chemical Company,
New York City, N. Y.

Editorial Note: In Mr. Baumeister's letter he referred to the practices in the architects' field. Below are the highly illuminating comments of Roger W. Sherman, Managing Editor, Architectural Record.

I am, of course, very much interested in what Mr. Werner Baumeister has to say about standardized literature. His point is well taken indeed and so far as it goes I am in complete agreement with him. However, I do not believe that he goes far enough. Although the A. I. A. Filing System has proved of help to the architect in keeping material of a reference character, by far the most important development in this field has been the Sweet's Catalog Files. As you undoubtedly are aware, material in Sweet's Catalog Files is collected in one place—it is prefiled so that the architect is under no necessity of setting up his own loose-filing system. As a series of bound volumes Sweet's Catalog Files make instantly available from one source a vast amount of technical information to which the architect constantly refers.

I cannot quote offhand all the statistics that are available to prove that prefiled information is vastly more efficient than the most elaborate series of individual technical brochures. It seems to me that this is the direction in which Mr. Baumeister ought to point if he is seeking an ultimate solution for his industry's present problem.

From a Company President

Both the idea of standardization and the size recommended appear highly desirable. We are willing to adopt the suggestion.

WILLIAM J. REARDON, President,
Reardon Color and Chemical Works,
Cincinnati, Ohio.

From a Purchasing Agent

The idea is an excellent one and I am in complete agreement with the author's views. I would like to see chemical manufacturers standardize on their literature for easy classification and reference.

S. F. URBAN,
E. R. Squibb & Sons,
Brooklyn, N. Y.

From a Chemical Specialties Maker

Ten or fifteen years ago there was considerable controversy in the automotive aftermarket regarding the great variation in sales and advertising literature supplied to the wholesalers.

After considerable effort two standard sizes were adopted, 8½ x 11 and 8½ x 10⅝.

During the intervening years three types of loose leaf binders appeared in the industry and most firms supply their selling sheets punched for any of these three systems.

A typical four-page folder and an individual selling sheet are herewith attached.

The system has worked very satisfactorily for manufacturers, wholesalers, wholesaler representatives, dealers and consumers. We are, of course, very much in favor of such a uniform system.

C. A. BENOIT, President,
Permatex Company, Inc.,
Sheepshead Bay, N. Y.

From a Vice-President

Being both on the receiving and sending ends of chemical catalog and circular service, I appreciate Mr. Baumeister's position completely. I can see how important the uniform system of disseminating information of this type would be to a chemist or purchasing agent who desires to obtain the sources of supply and specifications of a specific chemical. Fortunately, we have the *Chemical Industries Buyer's Guide Book* which will immediately give several sources of supply of a particular chemical, and it is then a simple matter to refer to the catalog of one or more of the companies so listed.

On the other hand, many occasions arise where a chemist is more interested in obtaining a particular result, rather than sending information on a certain chemical per se. Thus, if he is looking for a plasticizer, he would, according to Mr. Baumeister's plan, be obliged to look through his files for particular plasticizers specified by name, with the great possibility of missing a number that may be even better for his purpose.

If the circulars were classified according to use, it would either mean an elaborate system of cross indexing or a very extensive and complicated file, as so many chemicals have numerous and totally unrelated uses.

A catalog also serves another and no less important service. Very often, when looking through a catalog in search of a particular chemical or piece of information, one may come across another chemical or another piece of information which may set in operation a series of thoughts along other lines, which would have been missed if reference had been made only to one isolated circular.

Of course, there is no objection to standardizing an 8½ x 11 size catalog if this is handier for the files, but loose leaf circulars are so apt to get lost, mislaid or misfiled, that I am afraid the laudable object of easy reference would be "lost in the shuffle."

That there is plenty of room for improvement in the catalogs sent out by various chemical companies no one can deny and I, for one, am very glad that Mr. Baumeister raised the question. Perhaps CHEMICAL INDUSTRIES might consider an article or a symposium on what the customer expects or should expect from a chemical catalog.

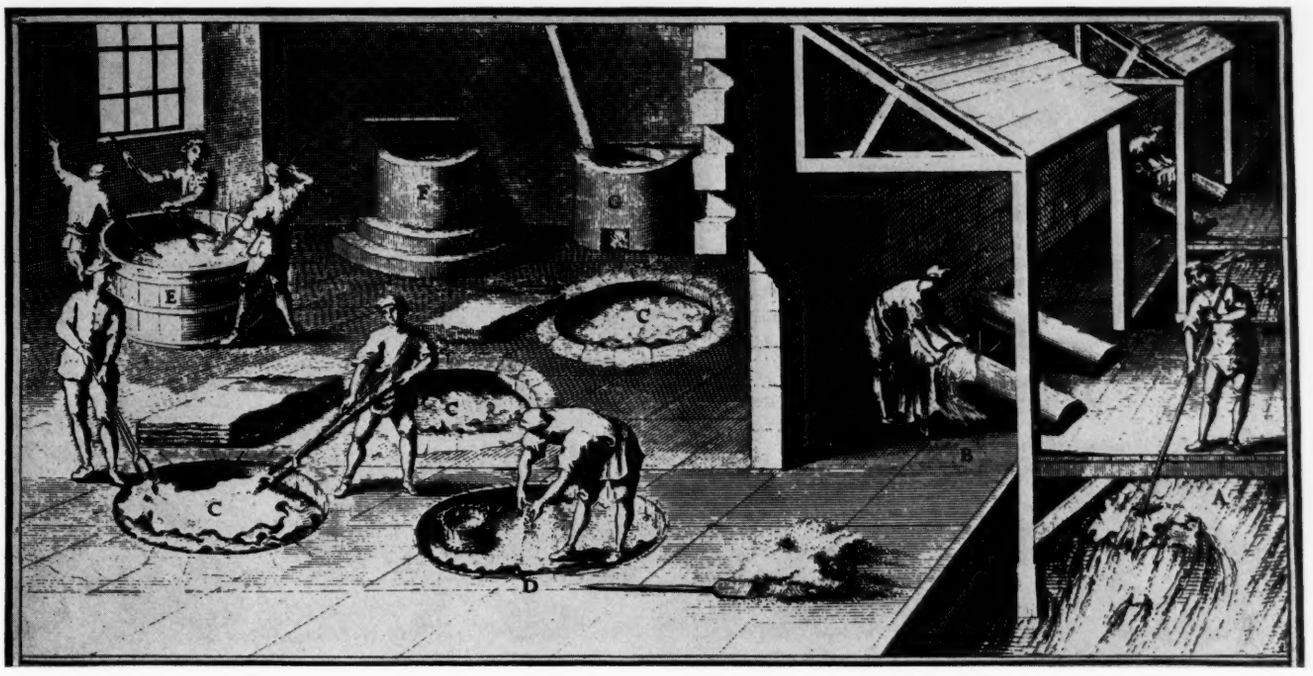
E. ROSENDAHL,
Glyco Products Co., Inc.,
Brooklyn, N. Y.

A Prominent Director of Publicity

We are thoroughly in sympathy with the basic premise set forth by your correspondent in connection with standardized literature. Whether practically this standardization can go all the way to standard catalog sheets which all manufacturers could use as a model for form or not is a debatable question, of course. An item of equipment which has form and dimensions and is subject to explanation from a design and operating point of view might very well be presented in such standard

(Continued on page 802)

18TH. CENTURY TANNERY



A. Washing
B. Fleshing and unhairing
C. Lime pits
D. Covering with bark
E. Vat for ooze
F. Soaking skins in tan color and stirring
G. Kettle

The above reproduction of an old print shows that the art of tanning was well developed as far back as the 18th century. It was not, however, until 1884, when Chrome Tanning was first introduced, that any fundamental improvement in the process of tanning was accomplished.

Today, leather tanning is one of the largest uses for Bichromate of Soda. Chrome Tanning is both quicker and less expensive than the older vegetable methods. In addition, Chrome tanned leather is superior because the Chrome solution combines with the fiber to produce a tough, pliable wear-resistant leather.

Mutual's Bichromate of Soda and Potash have been used by the leading tanners continuously since the inception of Chrome Tanning.

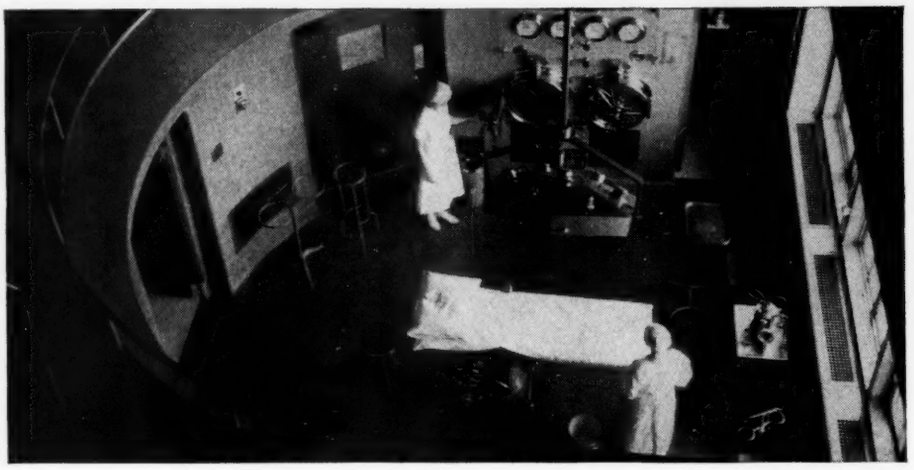
MUTUAL CHEMICAL CO. OF AMERICA NEW YORK N.Y.

Mutual Chemical Co of America

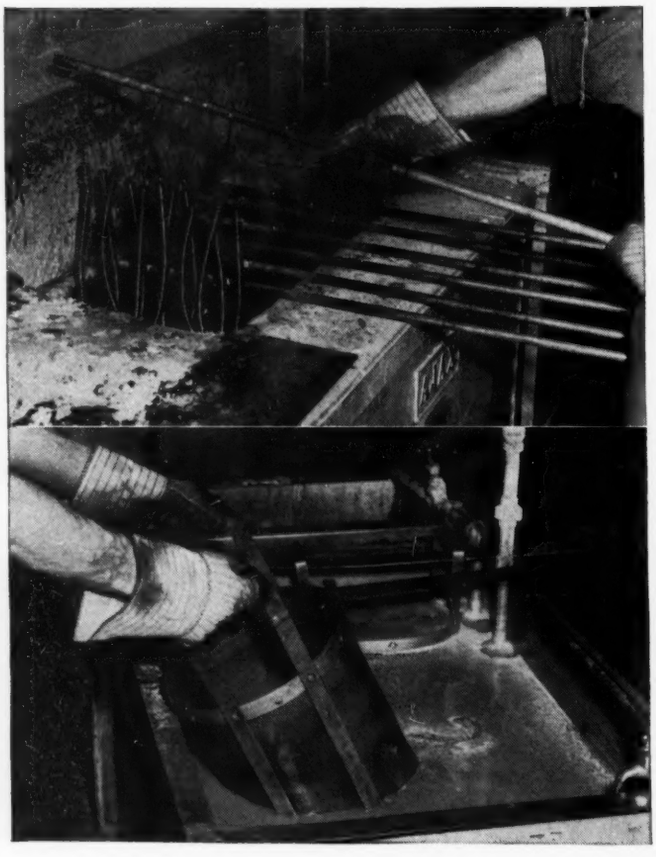
270 MADISON AVENUE, NEW YORK

LIFE on the

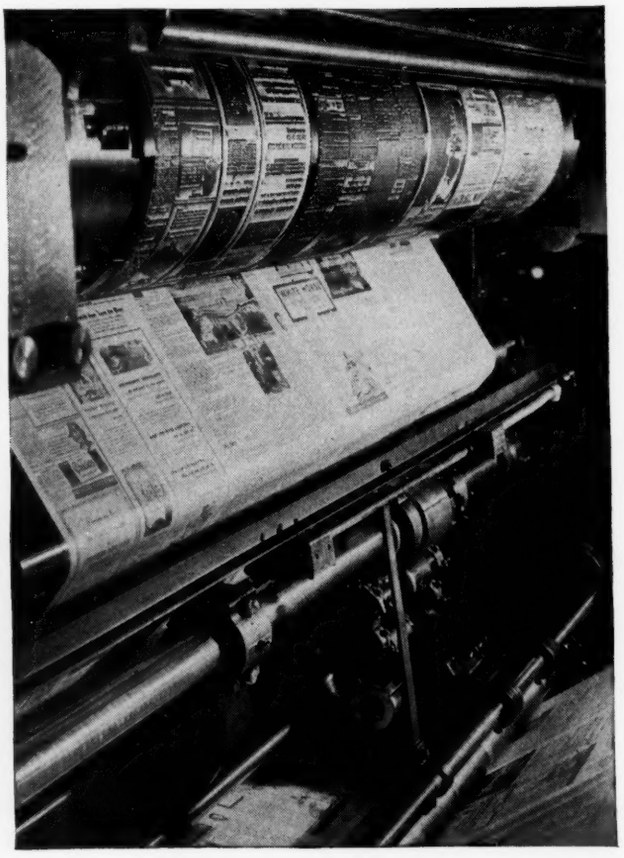
(*Right*) **MOST POWERFUL** of wetting agents commercially available, AEROSOL* OT is being utilized in more and more processes as industries learn of its superior strength and wetting power, its extreme economy and its exceptional effectiveness. In commercial antiseptics and disinfectants for use by hospitals and institutions, the unusual penetrating power of AEROSOL OT can aid in increasing the effectiveness of solutions which are intended to destroy bacterial or protozoal parasites. This is but one of a wide variety of newer uses for Cyanamid's AEROSOL Wetting Agents. Other recent applications of these versatile materials include processes involving dyestuffs, pharmaceuticals, cosmetics, rubber, printing ink, metals, textiles, paper, paints, varnishes and lacquers.



(*Below*) **RAPID, UNIFORM CARBURIZING** of steel parts with Cyanamid's AEROCARB**—and the quick, easy washing which it makes possible—are helping to boost production on today's rush-delivery orders. Top photo shows hundreds of cams, strung on wires, being lowered into the heat-treating bath of AEROCARB at plant of International Business Machines Corporation. Lower photo shows carburized parts being lowered into cleaning solution for quick, easy rinsing. AEROCARB needs no costly special equipment.



(*Below*) **NEW INKS USE WATER** to improve their characteristics. One such printing ink is practically odorless and is reported to set instantly and permanently when a mist of water is applied, thus permitting high press speeds. Another new ink, using a water base instead of oil, is expected to improve appearances of newspapers. Many Cyanamid synthetic resins and other materials are also contributing to the progress of the printing ink industry and the graphic arts.



Chemical Newsfront

(*Above*) **TREES ARE NOW CURED** of the usually destructive bleeding canker disease by injection with organic chemicals. This is said to be the first successful employment of the injection method of internal medication for the treatment of trees, according to Bartlett Tree Laboratories, who are responsible for this unique development.

(*Above*) **STAINLESS FINGERPRINTING,** which eliminates the need for smudgy fingers, has been reported. Fingers are simply touched first to a chemically-treated pad, then to sensitized paper cards. Dark impressions are made on the paper, but the fingers stay clean. Government agencies and industrial concerns are already using the new method, because of its cleanliness and effectiveness, it is reported.

(*Below*) **PORE-PATTERNS BECOME VISIBLE** in paper by a new process which utilizes inorganic chemicals. Major uses will be in classifying porous materials such as paper, according to B. W. Nordlander, of General Electric Research Laboratories.

(*Above*) **EXCELLENT SCUFF RESISTANCE** and distinctive grain are now assured to kid shoes by use of Cyanamid's new line of TWECOTAN*** Vegetable Tanning Extracts in the "crushed kid" tanning process. Kid leather has always been a favorite because it is "easy on the feet," but former tannages did not protect the grain sufficiently against scuffing.

American Cyanamid & Chemical Corporation

A Unit of Rockefeller Cyanamid Company

30 ROCKEFELLER PLAZA NEW YORK, N. Y.

*Trademark of American Cyanamid & Chemical Corporation applied to wetting agents of its own manufacture.

**Trademark of American Cyanamid Company applied to tanning compounds of its own manufacture.

***Trademark U. S. Patent Office

ADVERTISING PAGES REMOVED

SPECIFY HEYDEN

Glycerophosphates

A complete group of the official and non-official compounds of Ortho-Glycerophosphoric Acid.

•

CALCIUM GLYCEROPHOSPHATE N. F.
Powder

IRON GLYCEROPHOSPHATE N. F.
Powder

MANGANESE GLYCEROPHOSPHATE N. F.
Powder

MAGNESIUM GLYCEROPHOSPHATE
Powder

POTASSIUM GLYCEROPHOSPHATE
50% and 75% Solutions

SODIUM GLYCEROPHOSPHATE N. F.
Crystals and Powder

SODIUM GLYCEROPHOSPHATE SOLUTION
50% and 75% Solutions

GLYCEROPHOSPHORIC ACID
25% Solution

Write for Current Products List

FINE HEYDEN CHEMICALS

HEYDEN CHEMICAL CORPORATION
50 UNION SQUARE • NEW YORK
Chicago Branch: 180 N. Walker Drive

Factories:
Garfield, N. J. : Fords, N. J.

"MERELY A RIPPLE"

A PEBBLE DROPS INTO A QUIET POOL. MERELY A RIPPLE APPEARS ON THE SURFACE, BUT A WHOLE SERIES OF COMPLEX REACTIONS IS SET UP BENEATH IT. A NEW GROUPING OF MOLECULES IS ACHIEVED IN A CHEMICAL LABORATORY —MERELY A RIPPLE, PERHAPS—BUT NONE CAN FORESEE ALL THE FORCES IT MAY SET IN MOTION. WHAT AN INCENTIVE TO THE EVER-INQUISITIVE MIND OF THE CHEMIST!

Probably only a chemist can understand the never-ceasing exploration of the unknown that is daily work for so many of us in the chemical-producing and chemical-using industries.

Here at HOOKER, it is the very life of many specialists. Out of their research have developed numerous new chemicals, better methods of guarding the purity and uniformity of HOOKER products, new applications to improve processes and products. In this work, wholehearted co-operation with customers' chemists plays an important part. HOOKER welcomes consultation and opportunities to help solve problems involving the production, choice and use of chemicals.

HOOKER

ELECTROCHEMICAL COMPANY

NEW YORK CITY — NIAGARA FALLS, N. Y. — TACOMA, WASH.

MURIATIC ACID · CHLORBENZENES · SULFURYL CHLORIDE · ANHYDROUS METAL CHLORIDES · METHYL BENZOATE
LIQUID CHLORINE · THIONYL CHLORIDE · CAUSTIC SODA · SODIUM SULFIDE · DYE INTERMEDIATES

1032

Washington

By

MACK H. WILLIAMS

IF the national mood regarding our progress under the defense program is one of bewilderment today, it can be traced to misleading optimism.

Just as production chiefs got through congratulating themselves on the "phenomenal" and "tremendous" achievements in the first year, President Roosevelt warned the dictator nations we will fight if they move in our direction.

This implication of approaching war sobered the OPM. Production Director John D. Biggers acknowledged a great part of industry is still dozing along on one-shift operation, with subcontracting lagging and huge backlogs of orders piling up behind primary contractors.

Mack Williams

To speed the diversion of every possible plant and worker to war goods production, Biggers indicated that business men will soon be deluged with government orders that will compare with those already issued like "heavy logs to kindling wood."

Army funds of four billion dollars, a Navy purse of five billions, and a lend-lease act allocation of 2.9 billions have not yet been drawn against. In addition, Congress is ready to appropriate more billions as the military revises its conception of the armed forces that will be necessary for our eventual part in the war.

When this vast treasury is unloosed on industry in the form of orders, OPM will make 24-hour plant operation and unrestricted subcontracting mandatory.

Spending for chemical and powder plant construction and expansion in the first defense year totaled $356,958,000, of which the government provided $303,707,000 and $53,251,000 came from private sources. For ammunition, shell and bomb plants the government spent $282,425,000 and private companies $38,161,000 for a total of $320,586,000. The figures are doomed to obsolescence by the hard, painful realization in Washington that production facilities are still inadequate.

Priority Difficulties

Priorities are counted on to bring some sense into the scramble for raw materials that will surpass anything we have yet experienced. The OPM Priorities Division suffers from an administrative deficiency that will prove a serious impediment unless corrected.

With supplies of many items frantic for mandatory priorities in order to ease their decisions on filling orders, the division has refrained from this step wherever possible. Chief reason is that the comparatively small staff and overburdened personnel are incapable of meeting the details.

Priorities on chemicals, accompanied by Office of Price Administration and Civilian Supply allocations directing how the non-military stocks may be apportioned among users, will be issued as rapidly as the priorities division whips itself into shape for the task.

Modified, but strict, priorities on steel and copper are notable because they include for the first time evidence of the new working arrangement between E. R. Stettinius, Jr., and Leon Henderson.

Henderson has full sway in deciding through OPACS which companies shall obtain materials after military orders are filled. In effect, the priorities division has withdrawn its powers to allot remainder supplies to civilian needs, leaving the task entirely to Henderson.

Price ceilings remain Henderson's most drastic action to hold down prices. As in the case of ammonium sulfate, when he requested producers of the fertilizer to hold last-season quotations of $28 a ton at inland ovens on contract and $29 a ton at port, Henderson will exhaust voluntary efforts before drafting formal maximum schedules.

How long the industry's whole-hearted cooperation can stifle increases against a combination of swollen national income, higher wage rates, greater farm benefits and dwindling quantities of goods, is problematical.

The best view in Washington is that a formal Congressional price freezing order will be necessary before long.

Washington Briefs

President Roosevelt has sent to Congress recommendations of the National Resources Planning Board that the government encourage industrial research, "now a major national resource." The Board, noting that the chemical industry led all others in percentage of income devoted to research, made these recommendations:

1. That the government refrain from restrictive policies, because a tendency to capitalize research expenditures for tax purposes would threaten industrial science.
2. That the government provide for systematic and complete publication of abstracts of scientific and technical literature, now a growing drain on the limited finances of scientific societies.
3. That the National Bureau of Standards and other U. S. laboratories conduct more research on standards with sufficient funds to publicize and distribute their findings.

Anti-Trust Policy

A new trend in the Justice Department is steering it away from the policy of prosecuting corporations on anti-trust charges if the prosecutions endanger their contributions to defense. Major units in the oil industry, now ruled by Interior Secretary Ickes as federal oil coordinator, will not be harried by the monopoly hunters in the Department while they are working on government orders.

The trend follows the wry complaint of many chemical executives that companies in this field are "indicted at 10 A. M., and given a government contract at noon." While indictments now pending in various courts will not be withdrawn, it is understood little pressure will be exerted by the Justice Department, in order to permit company officials to give unhampered attention to defense work.

Export Control Regulation

The State Department has authorized customs collectors to permit exportation of products under export control which vary in weight, volume or value from the figures on the export license. A scale of tolerances amounting to 10 per cent. by weight or volume is in effect for all products, with these exceptions:

Pharmaceuticals and finished drugs, 1 per cent.; platinum and platinum group metals, 1 per cent.; industrial diamonds, nearest carat; radium and radium salts, nearest 100 milligrams; uranium and uranium salts, nearest 100 milligrams.

A tolerance of 10 per cent. in value is allowed on all products.

Coastwise Shipping Developments

The Maritime Commission early this month called upon Atlantic and Gulf coastwise steamship lines to turn over 50% of their estimated 750,000 tons of

ships for "national defense purposes." Some of the ships will be transferred from their normal runs and used on routes where needed for hauling strategic and other defense materials.

Operators of 14 coastwise shipping lines affected are in Washington discussing the transfer and working out details.

Shortage of Drugs

In New York City this month the Purchasing Office division of chemical and drug purchases reported a scarcity of essential chemical and pharmaceutical supplies attributed to the diversion of basic chemicals for industrial uses in the defense program. Smaller manufacturers of medicinal supplies have reported to the division that they will be forced to shut down unless priority ratings of defense contractors are modified.

Manufacturers of basic chemicals, on the other hand, say that the situation is one for which they were unable to prepare. One of the largest producers of basic chemicals reported that its entire production of many key products was going into defense work leaving none whatever available for pharmaceutical uses. Typical of the defense jam is the situation in methanol and formaldehyde, used in the manufacture of pharmaceuticals to a great extent. Plastics manufacturers with priority ratings are getting the entire production.

Zinc products, it was also pointed out, are increasingly hard to buy with all available zinc going into munitions and defense production. Garbage dumps and other similar places are finding it harder to buy deodorants—orthodichlorobenzine and sulfonated castor oil and such things.

More on Labor

At our last count, there were in this country 34 strikes curtailing production on War Department contracts. There were 40 strikes holding up Navy Department contracts. There were about 20 other strikes, including one in the aluminum industry, threatened by labor leaders in different sections of the country.

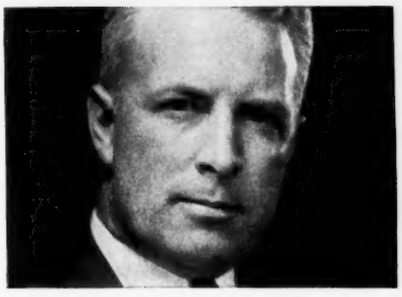
Telephone Bills Cut

The Federal Communications Commission early in June acted to bring about another reduction in long distance telephone rates, estimated to save the telephone-using public $14,000,000 a year, beginning July 10. Part of the reduction will apply to long lines rates and part to a reduction in interstate rates of 21 companies in the Bell system.

This is a reduction of about 14 per cent to users of long distance telephone and other long lines service.

4 REASONS WHY

You Should Investigate BEMIS WATERPROOF BAGS



"INCREASE SALES" ... *say executives.* By delivering products in better condition Bemis Waterproof Bags are building new and repeat business for scores of leading companies.

"A MIGHTY GOOD BUY" ... *say purchasing agents.* Comparative tests prove Bemis Waterproof Bags are a mighty good buy from every angle ... economy, service and sales.

"TOUGHEST BAGS YOU EVER SAW" ... *say warehousemen.* Ask the men who handle shipping containers ... they'll tell you, "For strength and toughness you can't beat a Bemis Waterproof Bag!"

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CHEMICAL INDUSTRIES
The Chemical Business Magazine
Established 1914

A New Chapter In Defense

WHETHER you listened to the President's discussion of the foreign situation alone in the privacy of your home, on a train, in a club, or as we did in the company of some 20,000 others at a night baseball game, whether you are an executive, a technologist, a workman, or an editor, whether you are an isolationist or an interventionist you must have been profoundly stirred. For each and every one of us it was a solemn call to duty, to sacrifice, to labor and possibly even to die.

One may and one is entitled to believe if he so chooses to believe that the course which has been charted for us was and is unwise. But in the final analysis it must be admitted by all honest men and women who do differ that such differences are largely if not entirely concerning details and not the main premise which is the maintenance of our way of life.

It is well to remind ourselves that politics end at the water's edge. It is well to recall those famous words of Stephen Decatur "May my country always be right, but my country right or wrong." It is well for all of us to read again and again at least the following portion of the President's proclamation:

"I call upon all the loyal citizens engaged in production for defense to give precedence to the needs of the nation to the end that a system of government that makes private enterprise possible may survive.

"I call upon our loyal workmen as well as employers to merge their lesser differences in the larger effort to insure the survival of the only kind of government which recognizes the rights of labor or of capital.

"I call upon loyal State and local leaders and officials to cooperate with the civilian defense agencies of the United States to assure our internal security against foreign directed subversion and to put every community in order for maximum productive effort and minimum of waste and unnecessary frictions.

"I call upon all loyal citizens to place the nation's needs first in mind and in action to the end that we may mobilize and have ready for instant defensive use all of the physical powers, all of the moral strength and all of the material resources of this nation."

No one questions for a moment our latent abilities to produce the sinews of war, or call it defense if you prefer, once we are totally aroused as a nation, once we are welded into a homogeneous group. But this process is taking time here as it did in England, as it did in Canada and indeed as it always does in any democracy. After some months of procrastination we reached at the beginning of this year the point of view that "business as usual" must be discarded and now we are rapidly reaching a somewhat similar conclusion on "living as usual."

We of the chemical industry have a particularly important part to play in whatever fate holds in store for us as a nation for upon us depends much of the all-out effort that must be and will be made. American chemical ingenuity will meet the supreme test in 1941 and 1942 as it did in 1918, but it will require the wholehearted effort of each and every one of us whether we sit in the president's chair, stand at the laboratory desk or operate in the plant, whether we have three scientific degrees or wield a pickaxe and sign the payroll with an x. There are really no exemptions nor deferments.

Editorial

A thought to plant protection: Risking possible accusations of being somewhat premature or of arousing fear unnecessarily we are publishing this month in the Plant Operation and Management Section an article on the subject of plant protection geared with civilian defense methods. Very properly such an introductory article deals largely wth fire protection and approved methods of fire fighting.

To place our key chemical plants underground is manifestly impossible. New ones being erected with government funds are being located for the most part in the Mid-West but much of our existing manufacturing operations are in the East and along the Canadian border close to densely populated centers. For this reason it is well in planning plant protection to coordinate such efforts with the plans formulated for civilians.

In one of the many handbooks published by the British Home Ministry on the subject of air raid precautions is this very significant statement—"Emergency measures for reducing the fire risk are mainly a matter of intensifying the precautions which ought to be in force at all times." Despite the large quantities of flammable or explosive materials handled in many chemical plants the fire record of the industry is excellent. This achievement has been accomplished through intelligent design of equipment, careful training of personnel and wide-spread adoption of modern fire fighting technique. However, no matter how thoroughly plant officials have provided against any emergencies in the past it is now in order to re-open the entire subject for general review.

Standardized advertising literature: The suggestion of Werner W. Baumeister of the American Chemical and Oil Products Company that chemical firms standardize the sizes of their direct mail advertising literature, published in "The Reader Writes" page of the April issue, has brought forth several very interesting comments. These are published on page 692.

The overwhelming majority are heartily in accord with the general idea. It is evident, however, that certain other factors must be given due consideration. Competition for a busy executive's attention is terrific. Therefore advertising men see the necessity of stressing eye-appeal at least on certain types of booklets and catalogs.

One very well-known and successful advertising manager of one of the largest chemical companies while expressing agreement with the basic idea had this to say:

"As a matter of fact we are not so very anxious to have those who receive our literature file it away—we want them to keep it handy and read it and use it at their desks or in their plant. As you must know from your own experience the filing cabinet is usually or at least often the graveyard of many a good piece of sales literature."

Probably the correct answer to the problem is the proper determination on the part of the advertising manager of what is material of permanent reference value. One large chemical concern reports that it has solved the problem in part at least by holding rather rigidly to three sizes for all its literature. These are 8½x11 size for pieces that will ultimately be kept in file drawers; 6x9 for reference books that are made to be kept in bookcases; and envelope sizes for those pieces that are transient in interest only.

One thing is clear, however, and that is to get concerted action and uniform sizes in this industry it will be necessary to enlist the support and action of one or more of the associations or to ask representatives from a rather large number of companies to participate in a round table discussion.

Magnesium in the National Defense: Considerable publicity has been given in the past several months to magnesium and its part in America's national defense efforts and much of it has simply given a very erroneous impression to the general public. Mr. L. B. Grant, Chemical Engineer for the Dow Chemical Company, performed a distinct service in reviewing in such a thorough manner the entire situation before the Chicago meeting of the American Institute of Chemical Engineers last month. It is truly a factual report and CHEMICAL INDUSTRIES is delighted to be able to present the complete paper in this issue.

The man in the street has no idea of what is involved in the erection of a chemical or metallurgical plant. Little does he appreciate that at least nine months to two years are required in normal times. Nor does he understand the delays forced by difficulties in getting equipment in an abnormal period such as we are now in. He simply knows from reading his daily newspaper that there is a shortage of this and that and wonders what is wrong with our industrial set-up. Perhaps to some degree we collectively are to blame for we have been guilty of throwing out our chests and talking pretty loosely of our successes without stressing sufficiently the time, the labor and the money that has been employed.

The story of magnesium is one of the real industrial romances of the post World War period. Very few saw any possibilities in it. They pointed to a number of unfavorable factors, including high production costs, poor mechanical properties, poor corrosion resistance in salt water, no known methods of fabrication, little or no reliable information on design of structures and lack of markets requiring light weight.

Little by little by persistence, by hard work under discouraging conditions and by skillful research these factors have been overcome. A perfectly Herculean task is involved in supplying the nation with the magnesium it will require in its defense plans. It is estimated that approximately 1,000 pounds of magnesium are consumed per plane and this figure is steadily increasing as more and more aircraft parts are being designed in the metal. At the moment the plans are to produce some 4,000 planes per month in 1942. This means in round figures at least 50 million pounds or more of metal. This is quite an increase when one considers that the output in 1915 was 90,000 pounds and even as late as 1939 it only totaled 6,700,000 pounds. Yet with this unprecedented increase in demand the situation in magnesium looks better than in some other products.

Recording an epoch-making achievement in chemical engineering

1941 will forever remain an outstanding year in the history of chemical engineering progress.

For on January 21st, at Freeport, Texas, a truly epoch-making achievement was accomplished—the first production of magnesium metal extracted in commercial quantities from the waters of the sea.

Metal from sea water—magnesium—lightest of all structural metals in common use.

This achievement is the fruition of Dow's 25 years of experience in the continuous development of magnesium metal production. For at Midland, back in 1915, Dow began extracting magnesium from Michigan brine by its own processes.

A quarter century of effort in developing uses and applications for DOWMETAL* (Dow's name for its Magnesium Alloys)—creating demand that has permitted a progressive lowering of price—has made magnesium metal indispensable to American industry. Now demand is suddenly increased enormously. For magnesium is essential to airplane construction; vital to national defense.

The successful production of this all-important metal from sea water marks an epoch—the beginning of a new era in the production of metals.

THE DOW CHEMICAL COMPANY,
MIDLAND, MICHIGAN

New York City—St. Louis—Chicago—San Francisco—
Los Angeles—Seattle—Houston

Working with you for America

*Trade Mark Reg. U. S. Pat. Off.

TRADE MARK
DOWMETAL
MAGNESIUM ALLOYS
LIGHTEST OF ALL STRUCTURAL METALS

MAGNESIUM in the National Defense

By L. B. Grant
Dow Chemical Company

This article was presented as a paper at the recent Chicago meeting of the A. I. Ch. E., in connection with the National Defense Symposium. Giving both the disadvantages and advantages of the metal, Author Grant points out that with a great number of unfavorable factors now eliminated, advances in its technology have merely begun. The future looks bright for this metal.

TO understand the position of magnesium metal in the present National Defense Program, it is necessary to review the development and growth of the U. S. magnesium industry since its inception in 1915. At that time the uses for magnesium were very limited and the market, consequently, very small. Total U. S. production in 1915 was 87,500 pounds valued at $440,000.00. Sales were principally in the form of powder which was used for tracer shells, aerial bombs, and rockets; and magnesium powder was chosen for these uses because it burned with a brilliant, white light. World War I gave a marked impetus to the magnesium industry because these flares and bombs were used extensively by the Allies in their military operations and consequently U. S. consumption rose to 284,000 pounds in 1918 and then dropped abruptly with the close of the War.

Leading manufacturers felt at this time that there might be a potential market for peacetime purposes, but the obstacles were large and a survey of the factors involved in the manufacturing and marketing of magnesium did not look promising. Table 1 summarizes these more important favorable and unfavorable factors as they appeared in 1918.

One may well ask how a material with so many disadvantages has become an important, vital part of our National Defense Program of today. The answer lies in the continuous effort by the magnesium industry during the past 25 years to overcome these disadvantages by improvement of magnesium production and fabricating processes, by metallurgical research, and by a marketing and sales development program always prompted by the firm belief that magnesium some day would become an important structural metal and would, in addition, find an increasing field of application because of its unique chemical and metallurgical properties.

Production Cost

The average selling price of magnesium in 1918 was $1.81 per pound, and it was apparent that it could not compete at that price with other structural metals even though it were equal or better than these metals in other respects. The following price curve (Fig. 1) taken from Bureau of Mines statistics indicates what has been accomplished in reduction of production costs from 1918 to 1940.

Mechanical Properties

Magnesium like most other pure metals, is soft and has low mechanical properties. It was, therefore, necessary to carry on a continuous and extensive research program for many years to develop alloys high in magnesium content that could compete in structural uses with other metals. Thousands of combinations have been made and tested and as a result

TABLE 1

Favorable Factors	Unfavorable Factors
(1) Light weight (Specific Gravity 1.74).	(1) High production cost.
(2) Abundance of raw material from which to manufacture.	(2) Poor mechanical properties.
(3) Good machinability.	(3) Poor corrosion resistance in salt water.
(4) Certain chemical characteristics (deoxidizer and Grignard reagent).	(4) No known methods of fabrication.
(5) Pyrotechnic qualities.	(5) No information on design of structures.
	(6) Lack of service data.
	(7) Lack of markets requiring light weight.

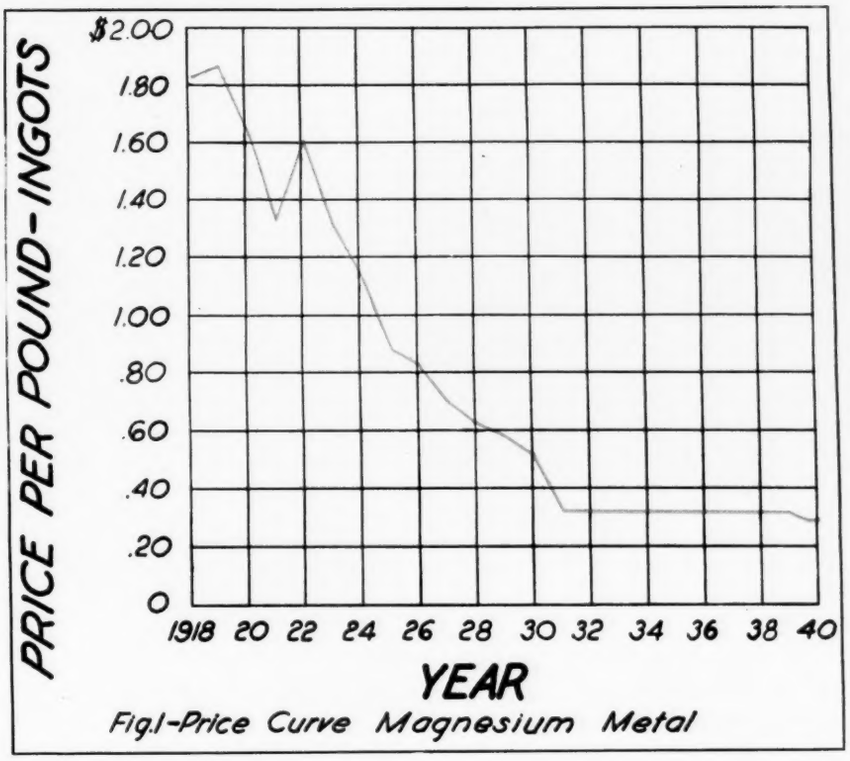


Fig.1-Price Curve Magnesium Metal

alloys are now available that can meet competition, especially where a low weight-strength ratio is required. It has been found that zinc, aluminum, and manganese are generally the most useful for alloying with magnesium and the government-approved alloys of today all contain one or more of these alloying metals. The following table (Table 2) gives the composition and more important mechanical properties of the magnesium alloys now in common use in the National Defense Program.

Corrosion Resistance

The corrosion resistance of magnesium alloys has long been a favorite subject of discussion among metallurgists, and most of their unfavorable comments had some justification based on facts as known in the early stages of development. The magnesium industry attacked this problem and soon found that work was necessary on:

(1) *The elimination of chloride flux inclusions.*
(2) *The development of alloys having inherently better corrosion resistance.*
(3) *The control of harmful metallic impurities.*
(4) *The development of suitable chemical surface treatments.*
(5) *The development of better paints and painting schedules.*

Practically all melting of magnesium alloys is carried out under protective fluxes and these fluxes usually contain chlorides which if entrapped in the metal greatly accelerate corrosion. The development of better fluxes and of better handling technique has conquered this problem so that corrosion due to flux inclusions is now non-existent.

It was indeed fortunate that some of the same alloying metals that improved mechanical properties also increased corrosion resistance. Both zinc and manganese, if used in the right proportion, accomplish this purpose and present alloy compositions are designed to meet both strength and corrosion resistance requirements. It is interesting to note that the Army Air Corps never felt that magnesium alloys had sufficient corrosion resistance for use in airplane parts until they specified the present zinc-bearing alloys about 1938.

One of the most important researches in recent years shows that the resistance of magnesium alloys to salt water is greatly affected by extremely small amounts of metallic impurities and critical allowable amounts of these impurities in standard alloys have now been definitely determined. As a result of this work, alloys for die castings, extrusions, sheet, and forgings are now produced with maximum iron content of .005 per cent. and maximum nickel content of .005 per cent. The photograph in Fig. 2 shows two test bars of Dowmetal "H" alloy with controlled iron and nickel content and after six months' exposure to salt water.

It has long been known that certain surface chemical treatments have improved the corrosion resistance of magnesium alloy parts and the best known treatment until the past two or three years was the so-called "chromate" or "chrome pickle" treatment which consisted of immersing the article for a short period in a solution of nitric acid and sodium dichromate. However, this treatment was difficult to control and attacked the metal surface, thereby causing change of dimension and its protective qualities still left much to be desired. Many new treatments have since been perfected and one of the most efficient and commonly-used of these is known as the No. 7 treatment and is covered by U. S. Army Air Corps Specification 98-20010A part E-3B. It consists essentially of a 5-minute dip in a 15 to 20 per cent. solution of hydrofluoric acid followed by a 45-minute boil in a 10 per cent. solution of sodium dichromate. Magnesium parts thus treated

TABLE 2

Typical Properties of Magnesium Alloys

Property	Sand Castings Dowmetal H-HHT Army Air Corps Spec. 57-74-1C Navy Aeronautical Spec. M-112g	Die Castings Dowmetal R Army Air Corps Spec. 11319 Navy Aeronautical Spec. M-369	Extruded Shapes Dowmetal J-1 Army Air Corps Spec. 11320 Navy Aeronautical Spec. M-314c	Press Forgings Dowmetal J-1 Army Air Corps Spec. 11321 Navy Aeronautical Spec. M-126d	Sheet Dowmetal J-1a Army Air Corps Spec. 11317-A Navy Aeronautical Spec. M-111e
Ultimate Tensile Strength, psi	39,000	33,000	43,000	44,000	40,000
Tensile Yield Strength,* psi	12,000	21,000	28,000	28,000	25,000
Elongation in 2 in. per cent	12	3	12	13	15
Brinell Hardness	53	60	58	58	—

* Yield strength is defined as the stress at which the stress strain curve deviates 0.2 per cent from the modulus line.

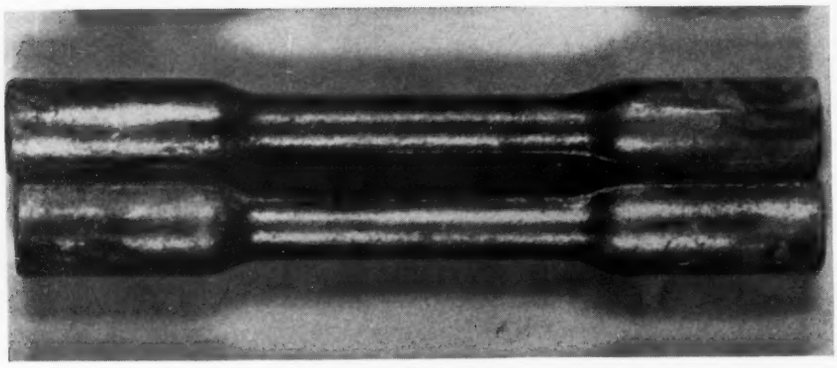


Fig. 2. Test bars of Dowmetal "H" alloy.

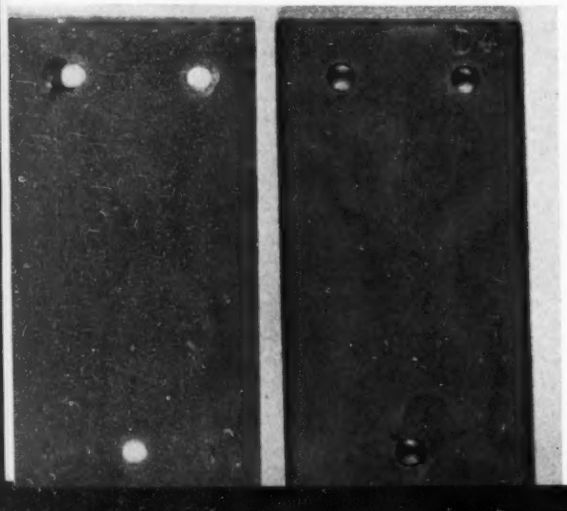
take on a uniform brown to black coating which affords remarkable protection and which acts as a good base for subsequent painting.

Paint manufacturers and the magnesium industry have worked together for years on the development of paints and painting schedules for magnesium alloys, this work including both short-time and long-time exposure tests to salt water and atmospheric conditions. As a result, paint schedules are now available that give good adhesion and protection. Fig. 3 shows two magnesium alloy panels after ten months' tidewater exposure and illustrates what can be accomplished with correct alloy composition, surface treatment, and painting. Magnesium alloy panels of twenty years ago subjected to the same conditions would be completely corroded away in a few weeks.

Fabrication Methods

It was not enough to develop alloys and surface treatments. Methods had to be found to fabricate these alloys into forms useful to industry. Attempts were first made to produce sand castings but the alloys were difficult to melt because they tended to burn in the molten condition, particularly at temperatures over 1300° F. It was found, however, that certain chloride mixtures or fluxes formed a protective layer on molten magnesium in the melting pot and it is now as simple to melt and pour magnesium as any other metal. Great difficulties were encountered with magnesium when it was first poured into sand molds because the molten metal reacted with the water in the sand and burning and excessive gas evolution resulted. The first commercial castings were, therefore, made only in dry, baked sand molds which greatly limited the scope of castings to be economically produced. Work was started on the development of sand agents or inhibitors which would prevent this reaction with water and the results have been so successful that magnesium alloys can now be cast in green sand with no more difficulty than is encountered with aluminum or cast iron. These sand agents generally contain sulfur, fluorides or both which vaporize and form a protective gas blanket between the molten metal and the wet sand. Intricate castings of all sizes and shapes are now readily made. Fig. 4 and Fig. 5 show typical aircraft engine and wheel castings which are being produced in large production quantities today.

Fig. 3. Magnesium alloy panels after 10 months' tidewater exposure.



It is estimated that approximately 6,000 to 8,000 men are now actively engaged in the production of magnesium sand castings for National Defense and this number will undoubtedly be much higher as the aircraft production program expands.

In a similar manner, problems incident to the production of magnesium alloys in wrought forms have been and are being solved so that magnesium alloys are now available in the form of die castings, extruded shapes, rod, tubing, forgings, and sheet.

Even after magnesium alloys became available in these forms, more work was necessary to determine methods for finishing and assembling them into the ultimate usable product. As an example, although magnesium is one of the easiest of metals to machine, it was necessary to do extensive research work on design of cutting tools and on proper lubricants and cutting speeds in order to fully take advantage of the metal's good machining characteristics. Large machining shops having several years' experience in machining magnesium now report that greater production machining speed can be obtained on magnesium castings than on any other metal castings.

Magnesium sheet presented many difficulties in forming and drawing because of cracking when these operations were carried out at room temperatures. Alloy development has now made possible to perform many bending and forming operations at room temperatures and deep draws can now be made by working at carefully controlled elevated temperatures. Fig. 6 shows typical aircraft parts made in this way.

Fifteen years ago, it was thought impossible to weld magnesium alloys, but gas welding, arc welding, and electric spot welding are being used on magnesium today in the production of military aircraft. Fig. 7 shows a typical gas welding operation in an aircraft oil tank.

It is interesting to note that the U. S. Army Air Corps recently awarded a contract to a well-known aircraft company for an all-welded magnesium airplane wing. If this project proves successful, it may revolutionize the whole aircraft industry.

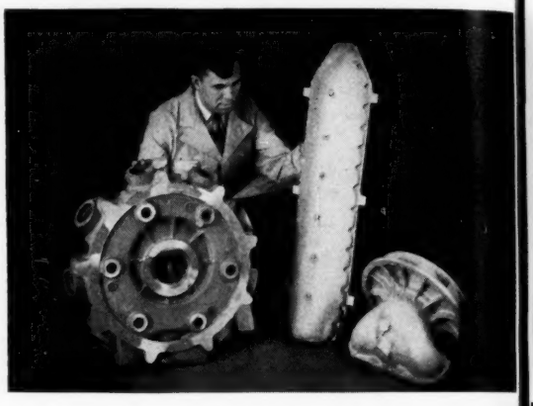


Fig. 4. Aircraft engine castings.

Design

In discussing the comparison between design data available to the engineers in the early days of magnesium alloys and now, mention should be made of the vast amount of strictly technical data now available as well as improved design practices from wider experience. For example, an early designer would be completely handicapped by lack of such essential data as ultimate and yield strength, elongation, hardness, etc. Today complete data on the chemical analysis and physical properties are readily available as well as experience for interpreting their value and influence on a finished design. It has been pointed out by J. B. Johnson (J. Aero. Sc. 6,185 (1939)) that, for instance, fatigue endurance results on machined test bars have limited practical value because of the vast influence of notch effect and the fact that all assemblies, by virtue of rivets, bolts, etc., have notch effect present. To overcome this obstacle, the practice of vibrating completed assemblies has been adopted in order to check the fatigue endurance under

service conditions. Such vibration and fatigue tests have been run on oil tanks and other aircraft sub-assemblies so that data are now provided on the desired details of welded joints, fitting attachments, etc., which provide the most satisfactory design. In the structural field, even the availability of the fundamental physical properties left the designer without sufficient data on column characteristics, strength of riveted joints, and other structural details necessary to make a completed design. Such information is now available.

Standards have been derived covering the proper relationship between diameters and length of studs and proper washer sizes for use with magnesium castings and proper methods of blending and filleting casting intersections have been developed. In aircraft assembly much work has been done on proper insulation between laying surfaces of dissimilar metals so as to eliminate electrolytic corrosion. The above notes give a brief indication of some of the problems which have been attacked and which have yielded design data.

It is interesting to look back at the sales approach of a few years ago when the magnesium industry was trying to introduce magnesium into structural uses. The usual sales arguments of light weight, good strength, and moderate cost were given but the potential customer invariably asked, "Has magnesium been used for this particular part before?" and the answer was necessarily, "No." There were, of course, certain pioneers in many industries who were willing to look ahead and take a chance on a new material, and it is these men to whom we are now largely indebted for the service data and experience gained by continued usage. One of the earliest uses of magnesium castings in this country was on aircraft inertia starters and this use has continued successfully through the years and has demonstrated the ability of magnesium castings to withstand long hard use. About 1930, a small airplane wheel manufacturer decided to experiment with magnesium wheels and dire results were prophesied, but that use has been successful and has grown, so that today magnesium wheels are used on the great majority of all modern military airplanes. These examples multiplied many times now form a firm basis on which the aircraft designer can specify magnesium with the knowledge that it will perform satisfactorily.

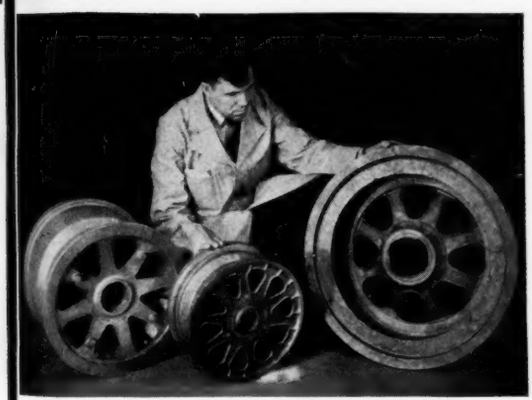


Fig. 5. Aircraft wheel castings.

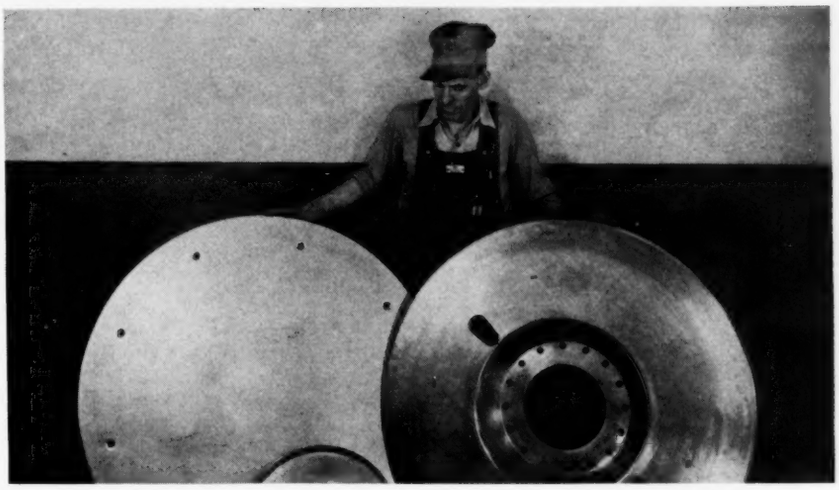


Fig. 6. Aircraft parts made possible by new alloy development.

It should be mentioned that during these same years metallurgists in other fields have been developing uses for magnesium as an alloying material and as a deoxidizer for other metals. Most of the aluminum alloys used in aircraft today contain small percentages of magnesium, and this fact has greatly increased present magnesium consumption. The good properties and stability of zinc die castings are also dependent in part on the use of .02% to .04% magnesium. Nickel alloys use magnesium as an efficient deoxidizer and desulfurizer and substantial amounts of magnesium are used to remove bismuth from lead.

Present-Day Markets

There is no lack of market requiring light weight today because the aircraft industry which now utilizes magnesium to save weight is undergoing a tremendous expansion. It is estimated that approximately 1,000 pounds of magnesium are consumed per plane and this figure is steadily increasing as more and more aircraft parts are being designed in magnesium. With airplane production figures estimated at 4,000 per month in 1942, it can be seen that the magnesium industry is rapidly reaching vast proportions and that magnesium is indeed a vital material for National Defense. This is, of course, most gratifying to the men in industry who have spent these many years in developing a little-known laboratory curiosity into an essential, useful metal.

In summarizing the position of the magnesium in 1941, we now find that most of the unfavorable factors reported in this paper have been eliminated or reduced so that a present-day survey would show:

Favorable Factors

(1) Light weight (Specific Gravity 1.74).
(2) Abundance of raw material from which to manufacture.
(3) Good machinability.
(4) Certain chemical characteristics (deoxidizer and Grignard reagent).
(5) Pyrotechnic qualities.
(6) Low production cost.
(7) Good mechanical properties.
(8) Good corrosion resistance in salt water.
(9) Well developed methods of fabrication.
(10) A background of design information.
(11) Twenty years of service data available.
(12) Tremendous airplane market requiring light weight.

This table of favorable factors should not be construed to mean that the task is completed. In fact, it is believed that advances in the technology of magnesium have only started and that the future will show improvements in metallurgy and manufacture and a widening of uses that are undreamed of today.

Fig. 7. Typical gas welding operation.

Personalities in Chemistry
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EDWARD RAY WEIDLEIN

By

A. D. McFadyen

The late Andrew W. Mellon, speaking in Pittsburgh at the dedication of the classic Greek edifice comprising the present home of Mellon Institute, after reviewing the history and accomplishments of the Institute, turned toward its director and said: "I cannot praise too highly all that Dr. Weidlein has done in developing this institution and making it a factor of such constructive value in the life of this country . . ." The speaker's view seems to be shared by everyone save Weidlein. He considers himself as but one of the "guild of scientists" associated with the Institute. Even when accepting the Chemical Industry Medal in recognition of his work at the Institute, Weidlein protested: "I think that this signal honor has come not to me as an individual, but to the group of research specialists of whom I am the director, in recognition of their original contributions . . ."

Mellon Institute is an independent, non-commercial research organization. It was founded in 1913, predicated upon the principle of industrial fellowships, through which industry might utilize the facilities of the Institute to solve its problems. The industrial research of Mellon Institute is organized on a contract basis, the problem being set by a person, firm or association interested in its solution, the scientific worker being found and engaged by the Institute. Each holder (fellow) of an industrial fellowship is given for the time being the broadest facilities for accomplishing a definite piece of research, and all results obtained by him belong exclusively to the founder (donor) of the fellowship.

By the application of the industrial fellowship system, the Institute has been successful in demonstrating to about 3600 American companies, either as individuals or as members of industrial associations, that research, properly conducted, is profitable to them, for most of the problems accepted for study have been solved satisfactorily. The Institute has also been active in stimulating research in other laboratories and in cooperating with other research establishments, both in the United States and abroad. It also conducts broad investigations in pure science, especially in chemistry. The Institute is best known, however, by the successful commercial processes which it has developed (evidenced by 800 U. S. patents), and by its contributions to the literature of chemistry and allied sciences (18 books, 153 bulletins, and 1,800 papers).

During the past year 93 industrial fellowships, employing 187 fellows and 114 fellowship assistants, have been in operation at the Institute, at a yearly outlay of $1,258,866. Especially important in these days are the fellowships in the domains of industrial hygiene, fuels, coal products, petroleum, synthetic organic chemicals, plastics, surgical supplies, foods, glass, building materials, heat insulation, refractories, and ferrous metallurgy.

It is difficult to think of Mellon Institute apart from Edward Ray Weidlein, and more difficult to think of Weidlein apart from the Institute, for Mellon Institute is Weidlein's life-blood, and vice versa. The career of Weidlein is not of the Horatio Alger story pattern; but rather it follows somewhat the theme of Hawthorne's "Great Stone Face." It is the story of a man who labored and lived with the master who inspired the creation of the Institute, until he became imbued with its principles and of stature to take the master's place.

Back at the University of Kansas (1907-12) Weidlein was steeped in the principles underlying the Institute, for there he was an associate of Dr. Robert Kennedy Duncan, whose book concerning industrial research was to come to the eyes of the Mellons and lead to his being called to organize and direct the Institute. Weidlein entered Kansas with the thought of specializing in banking. But as a lad he possessed a keen interest in botany and zoology, and this interest prompted him to take random courses in these subjects, as well as in the related field of chemistry. It was in the chemistry course that he came under the influence of Dr. Duncan, who had already organized a small-scale system of fellowships at Kansas. The young student manifested special aptitude in laboratory technique. The intimacy of professor and student developed, and Weidlein soon found himself on the instructing staff at Kansas, and next fulfilling a research fellowship involving a broad study of camphor. This work completed satisfactorily, Weidlein was next assigned to a comprehensive research of the ductless glands, during the course of which he toured mid-western slaughter houses to gather glands, and even went to Newfoundland to investigate epinephrin from the whale. His efforts were pioneer and resulted in many basic findings still of medical value.

When Duncan was called to Pittsburgh to organize the Institute he thought back to the brilliant young scientist who had so ably assisted him at Kansas, and Weidlein therefore was invited to join the Institute's staff. He entered the service of the Institute shortly thereafter, and through further intimate association and direction of Duncan, coupled with a natural ability and bent for scientific research, Weidlein was further groomed for the directorship of the Institute.

Weidlein's first assignment was as Senior Fellow having charge of all the Institute's investigations in the metallurgy and hydrometallurgy of copper, including supervision of the experimental plant at Thompson, Nevada, where he was located for about four years. In connection with this phase

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THE TECHNOLOGIST'S PLACE

In the World of Today

By Dr. Wallace P. Cohoe

Presented at a joint meeting of the Canadian Chemical Societies and the American Section of the Society of Chemical Industry in Quebec this month, this article describes the technologist of yesterday and today. Involving every science from agronomy to zymology, the technologists' five functions—control, production, application, research and counsel—are treated with utmost detail.

WE meet tonight in the ancient capital of Canada which was founded in 1608. At that remote date there was in the world nothing we would, today, call technology but, at that time, the mind of man was opening up in such a way as to make the growth of technology possible. A spirit of adventure had seized the whole of western Europe—an eagerness to learn of new lands and new peoples. All changed was the mind of Europe by this turn towards new things. When, at the end of the 13th Century, Marco Polo returned from his travels in Cathay and the Indies, his tales of these lands, their wealth, their government, and their peoples, were treated with the contempt considered due an enormous liar. It was not long, however, before people in Europe began to realize that the tales of Marco Polo might possibly contain a grain of truth because, over the old Overland route, traveling caravans were bringing to the West the silks and spices of the East. Adventurous men saw possibilities of easy wealth, if an easy way to the riches of the Indies could be found. And so, a little over 100 years before this ancient city of Quebec was founded, America came to be discovered.

This eagerness to make discoveries, this urge to explore unknown lands, which influenced profoundly the mind of man, was not motivated by any pure zeal for knowledge or exploration. Man was following then as he does today the lure of "easy money." In the pursuit of gold, man will endure all hardships, face all dangers, and put behind him all superstitious fear. Suppression of the fear of the unknown transmuted the medieval mind into the modern intellect. It dawned upon the mind of man that the intellectual methods of Aristotle were inadequate to reveal the mysteries of nature. Man began to think inductively. He found that it was futile to reach conclusions about nature unless he had previously observed nature. Aristotle bowed to Francis Bacon, who expressed the new intellectual trend when, in 1620, he published his *Novum Organum*. There was as yet no true science but, in 1628, there was born one, Robert Boyle, called with unconscious humor, "The Father of Chemistry and the Son of the Earl of Cork." In 1665, Sir Isaac Newton stated the laws of gravitation and, by 1685, largely as a result of his work, the unity of the solar system was understood. The mind of Newton was so great, moreover, that, not satisfied with giving us our knowledge of the laws controlling the movements of the heavenly bodies, he founded the science of mechanics. So thorough and so comprehensive was this foundation that it has made the design of machines thereafter, not a process of good guessing, but of scientific calculation.

Thus, we see, that the 17th Century which saw the founding of this ancient city, also witnessed the growth of scientific thought. This basis of fact and method made possible the scientific findings of the 18th and 19th Centuries and, upon the application of these findings, technology is founded.

The Precursors of Technology

If we were to write a genealogy of technology, we might say that primitive man had strength but little skill. Skill begat the arts of the middle ages. With the growth of science, skill became superseded by a knowledge obtained from a source outside the practice of a particular art. Whenever this occurs, the work of the technologist begins.

Should we try to plot in the form of a curve the progress of technology through the centuries, we should find that it had precursors. For many ages the curve would show little progress. A mathematician would call it an asymptote. As early as 4,000 B. C. there was a flourishing degree of Sumerian civilization. Ancient Egypt cultivated the arts of peace and of war. Greece enjoyed not only comfort and the arts to a degree upon which we look back with envy, but she also produced men of an intellectual caliber which has not been excelled by any since the age of Pericles. China gave us the peaceful arts of printing, silk culture, porcelain and paper-making. All these made peaks above the general asymptotic curve and these peaks were often followed by vast depressions. The deepest and longest of these, of which we know, was the period of the Dark Ages which succeeded the glory of the Roman Empire.

It is a long worm which has no turning and it is a long curve which has no transition point. In the century between fifteen and sixteen hundred, the curve of human progress took on a new direction. Discovery opened the mind of man and he began to study the universe by the experimental method. To us today it seems ridiculous that man had accepted the universe without question until human methods of thought had passed this transition point and that things today which seem almost axiomatic were undreamt of three hundred years ago.

Along this asymptotic curve some of the precursors had a very early origin. The man who first found how nodules of flint could be chipped into weapons and utensils, knew nothing of cleavage planes, but he did employ an experimental method. Thus, iron and steel were probably accidental discoveries made by comparatively primitive man. By working with iron over successive generations and possibly centuries, skillful men produced useful articles and machines made of this metal, but even Vulcan, the Blacksmith of the Gods, never approached a point where, by the use of his divine powers, he could design a metallurgical operation which could produce a steel of desired properties. You may call him, metallurgist, brewer, chemical engineer, mechanical engineer, electrical engineer, electronics engineer, physicist, or chemist, but in the broad sense each one is a technologist because he produces desired and useful results from ascertained scientific data.

We technologists are often asked what we mean by the word "technology." There can be no definition where the field is boundless. Wherever harvests are gathered, metals dug from the earth, food and clothing provided for mankind, wherever industry flourishes, in all these places the technologist has an essential function to perform. On the one hand he must be familiar with the findings of purely scien-

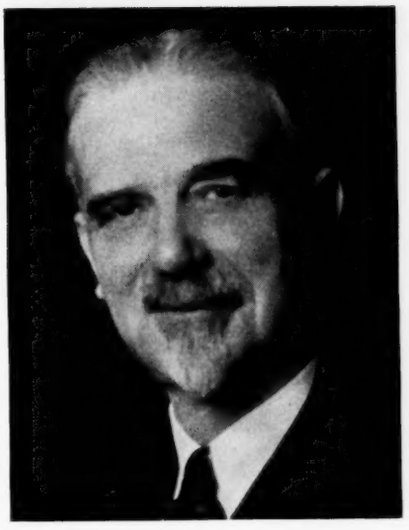
tific workers and, on the further side of his field, he must be conscious of the needs of mankind. Technology is not in reality so much a profession as it is a state of mind, since a technologist to be successful must apply scientific principles by scientific methods to produce that which the world needs and uses.

It is easy to see then that the old dictionary definition of technology does not and never has rung true. Technology is not the science of the peaceful and useful arts—unless we may call war a useful art. It is possibly true that in America the meaning of the term was fixed by the founders of the Massachusetts Institute of Technology. One can fancy that they may have been torn between two opinions. They could have called their school an Institute of Engineering, but they did call it an "Institute of Technology." We, not knowing what their thought was in 1885 when the school was opened, are quite free to conclude that they considered the term "technology" more inclusive than the term "engineering." Technology refers more generally to scientific backgrounds whereas engineering possibly has an implication of dealing with things rather than those principles which control arrangement of things.

It is natural for me to remember that the engineering faculty of the University of Toronto for so long as I can remember, and that is a long time, has been called the School of Practical Science. "Practical Science" is a splendid definition of technology. Those two words, "science" and "practice," carry vast implications. A technologist, therefore, is one who takes the findings of science and uses them for practical purposes. In so doing he must not only have a foundation of scientific facts, but to be efficient he must also employ these facts by scientific methods.

Let me repeat the words, a foundation of scientific facts, and ask whence and how we derive these foundation stones. One answer is that we are drawing continually from the vast storehouse of fundamental findings supplied by the pure research conducted in our universities. We technologists take this wealth and often use it without due or, in fact, any thanks for the bounties we have received. This storehouse of fundamental research has been filled by men who have "worked for the love of the working" without thought of gain, men who find more joy in wresting another secret from old Dame Nature than in houses and lands. Because they work in the cause of pure science and because in so doing they think only of science and not of themselves, I hope our clerical friends here tonight will forgive me if I say that these men constitute the priesthood of science.

That this storehouse of fundamental knowledge derived from pure research is being emptied faster than the rate of filling, is a novel idea. Only a few years ago the Lord Bishop of Birmingham, who is no mere dabbler in science, as those who have read his Gifford lectures can attest, suggested the wisdom of a five year moratorium in research to give the world at large time to digest the intellectual pabulum which, in his opinion, was being provided in quantities too great for immediate consumption. We realize, of course, that his Lordship knew that research could not and would not take any holidays. He may have been suggesting better digestive processes. Today it is unlikely that anyone thinks research is moving too rapidly. Only the other day a contrary point of view was expressed at a conference called by an international chemical manufacturing company. It was there suggested that industry should lend systematic aid to the support of fundamental research in universities deriving their income from private endowments since these funds are being rapidly depleted by depreciation in yield and value.



Today, the technologist, himself, is indeed adding to the storehouse of fundamental findings. He has realized that he cannot forever adopt his intellectual children. The boon of intellectual fertility is not the exclusive privilege of those who live and work in college halls. Fundamental research in pure physics, in commercial laboratories, has given us the comfort and economy of our present lighting methods. A chemical corporation has stated in a recent annual report that seventy per cent. of the profits reported, therein, were derived from the sale of products which were not in existence twenty years before. Before these corporations appropriated the vast sums needed in fundamental research, the technologist had established a basis of mutual trust and confidence in the minds of his executives. Once a decision has been made, there must be no strings attached to the money bags. When non-technical people inject themselves into technical situations, the results may be disastrous and are almost certain to be messy.

Having taken the stones of fundamental fact, the method of science is to proceed from fact to fact and in an orderly and logical manner erect a useful structure. The late Lord Tennyson as a young man wrote, "Science moves, but slowly, slowly, creeping on point to point." To this sentiment thousands of hungry stockholders echo a loud and unanimous "Amen." To make a road over an unfamiliar terrain to a point in unexplored territory is not easy. There are beautiful landscapes to admire. There are flowers to be picked by the wayside. To keep the road straight and to make progress along it continuously, requires a fixed purpose and an inflexible determination. Careful planning becomes more and more necessary as science progresses. Today, ideas cannot be picked up everywhere. They must be sought after, for the fields of knowledge have been carefully gleaned. As opposed to careful planning, there always will be the tendency, and frequently the necessity, to conduct "exploratory experiments." When such exploratory work appears necessary, the technologist today does not deceive himself but frankly labels the method "Edisonian."

Before leaving this part of my subject, may I say a word about a rather rare implement which is sometimes but not always found in the intellectual tool box. I refer to "common sense." Psychologists rarely refer to it for reasons concerning which it is best to maintain a charitable silence. This audience may not agree but I shall define "common sense" as the ability to unconsciously integrate the experience of the past to a present situation. It is a power of instant criticism, both destructive and constructive. It is the ability to decide quickly whether a proposed plan may be promising and possible or absurd; to decide at once whether a financial statement is correct or wrong; and often to find the proverbial two grains of wheat in two bushels of chaff. The man who has this power of common sense has the opportunity to become a leader.

The Field of the Technologist

Those of us who have been fortunate enough to visit Rome in the days when Rome could be visited, will always remember the inscription on the west front of the Mother Church of St. John Lateran. In power to express a large idea in few words, our language must yield the palm to Latin. Four words from that inscription, "ommnium urbis et orbis" stimulate in our minds associations of local import together with ideas of world-wide universality. The technologist has not been content, however, to confine himself to this terrestrial sphere. Every day the technologist employs the Heaviside layer, situated many miles above our atmosphere, in

order that a man in Africa may talk to his friend in America by radio waves. The field of technology is coterminous with the arts of peace and war.

To even catalog the various subdivisions of the field of technology would be impractical. Such a catalog could never be definitive and it certainly would require more patience on the part of an audience than any speaker has a right to expect. Technology employs every science and today there are no boundary lines between the various fields of science. There were a great many water tight compartments before the turn of this century, at which time the science of physics was by some regarded as a complete study. But right here in this province of Quebec began those investigations of Rutherford which extended the boundaries of that subject so far, that, today, no man can see the end thereof.

The astronomer, Sir Norman Lockyer, observed the helium line in the solar spectrum. His friend the chemist, Sir William Ramsay, found not only that helium occurred on the earth but also that our atmosphere contained rare elements hitherto unknown. By physical methods these gases were condensed to liquids, separated and purified. Then the electronics engineer selected one of these gases and used it, so that today our streets are ablaze with neon lights.

To illustrate the interlocking cooperation which is, today, an outstanding characteristic of technology, I will choose a most commonplace article of commerce —a package of chewing gum. Everyone pokes fun at it but millions buy it. It is employed to exercise the maxillary muscles and is said to aid digestion. Your airplane hostess hands it to you before the ship lands, in order that by swallowing you may equalize the pressure differentials, due to rapid changes of altitude, between the surrounding atmosphere and your inner ear. The by-products thereof are often used for paving purposes and upon this aspect the late Will Rogers wrote a monograph.

A typical package of gum consists of an assembly of five sticks. Each stick is covered on its six sides with white paper neatly folded for protection, around the inner cover is wrapped and pasted a printed label which covers the entire length of the stick. Five of these wrapped and labelled sticks are next assembled, then wrapped in metal foil, wax mounted on paper. This foil wrapper is heat sealed with wax to prevent drying out. Over the foil is applied a printed, transparent cellophane outside cover provided with an easy opening black cellophane strip. Heat seals the overlap and folds of the cellophane. These eight operations which involve eight different sources of material supply are performed by one machine.

Every second this machine swallows nine sticks of gum. One girl keeps the slide full of sticks, supplies fresh rolls of wrapping materials, and inspects operation. Another operator, at the outgoing end, inspects the finished packages at the rate of 108 packages per minute. From one end to the other, no human hand performs a single operation. To this machine mechanical engineers brought years of experience in building simpler machines, each one of which performed a single operation originally conducted by human hands. These single operation machines were combined to perform multiple functions until finally all functions have been combined into a single machine with many functions. For motive power and heating units the mechanical has called upon the electrical engineer; for his alloy steels upon the metallurgist who, in turn, had the aid of the chemist. For controls, because speeds are too great for mechanical means, the physicist has supplied photo cells or electric eyes. The original work on photo cells was done by Einstein. Those who wonder about the practical value of Einstein's work may consider this question while they are chewing their favorite gum.

While we back track from the machine itself to the materials which it uses, our minds are led literally to the ends of the earth. Paper calls to mind spruce forests, log drives on turbulent rivers, pulp and paper mills. Sulfite pulp is a child of technology. Cellophane reminds us of the viscose reaction of Cross and Bevan and of the first production of it by Brandenburger. It is another child of technology. The inks used in printing the cellophane employ materials which technology has synthesized within the last few years. The wax used takes us into the fields of petroleum refining where technology has reconstituted an old industry. The aluminum foil recalls the simultaneous invention of bauxite electrolysis in a molten bath by Hall & Heroult, which invention the latter always claimed was brought about by his great thirst—but that is another story.

To trace back the materials of the gum which is the primary employment of the machine, we should pass back through a factory where technical control and good housekeeping prevail to the raw materials which make up the little pieces which the machine swallows so rapidly. To follow these raw materials back to their origin, we would travel the rivers of Borneo in the canoe of a head hunting Dyak and even here we would find a technologist. In Central America we would view the tree covered temples of the lost Mayan Civilization. The sugars in that tablet will recall to our minds the high wheeled ox drawn carts of Cuba hauling the cut cane to the sugar mill where technologists control operations in both sugar mill and refinery. We think of the many people whose welfare depends upon the price of sugar. We would remember that the price of sugar may cause the rise and fall of governments and how Congress has debated for many weary weeks upon the subject of cane versus beet. The soft sugars take us to the corn fields of America and remind us that technologists found how to convert starches into sugar. For the origin of our flavors we would go to the mint fields of Michigan, the cinnamon groves of China, or to the Spice Islands.

"And lucent syrups tinct with cinnamon,
Manna and dates in Argosy transferred
From Fez; and spiced dainties, every one
From Silken Samarcand to cedared Lebanon"

Thus wrote John Keats in describing some of the things he was accustomed to see on the shelves of an apothecary shop where he was apprenticed.

You may wonder why, starting from a commonplace package of chewing gum, I have led you to some of the most superb lines written in the English language. I have done this because it is my steadfast belief that a technologist may become and should be a man of culture. Culture does not consist only in a knowledge of mythical heroes who performed impossible feats. Culture may be attained by following the commonplace to its origins and by integrating the knowledge so gained with every phase of human activity.

I have never forgotten a public statement once made by the late Charles William Eliot. He said "anything useful may be cultural." In the United States, Harvard is looked upon as a home of culture. In New England, it is regarded as *the* home of culture. In the last seventy-two years, Harvard has had three presidents. Of these, two—Eliot and Conant—have been chemists. In this center of learning, culture suffers from no apparent technological handicap.

The Functions of Technology

Any attempt to classify the functions of the technologist will of necessity be not entirely satisfactory. For one thing, technology moves so rapidly as to make such classification transitory. There is also overlapping to an extent which obliterates sharp boundaries. Having made what a lawyer would call a "self-serving declaration" I will set down the following classification by functions: (1) Control, (2) Production, (3) Application, (4) Research, (5) Counsel.

(1) Control. The control man sees to maintenance of quality both in raw materials and in finished products. To accomplish this he must follow materials through the various stages of manufacture in order that efficiency and quality be maintained. If he looks upon his work as a mere

matter of routine, the "lab boy" will beat him out. Content may degenerate into vegetation. He should be alert, and any deviation from the normal he should not merely suspect but regard as a matter of interest. Many a good idea has come from a so-called mistake. Some call this luck. But an ability to learn from the abnormal and capitalize the same, is usually due to alert observation.

(2) Production. With regard to production it may be pointed out that, whether in the growing of crops, the mining of metals, the refining of oil, the production of alloy steels, the manufacture of sulfuric acid, the dyeing of wool, the baking of bread, or in any of the hundreds of other activities, the technologist in charge must not only plan for efficient production but must also be constantly on the alert to foresee possibilities of more economical operation. Especially in the low profit industries, is this faculty valuable, since its exercise may lead to better profits and to an extended life period.

(3) Application. The conception of scientific ideas is futile unless the products produced therefrom be geared to public use. These potential uses must be demonstrated to their logical public. This is the work of the application man. When he has done his preliminary work on the inside, he invades the outside world. He is educating the outside public in the use of materials with which it may not be familiar. He is the evangelist of technology. A rare sort of diplomacy is required because the job forever puts him in conflict with that universal characteristic of human nature which is often called conservatism. Really, it is resistance to any change in the *status quo*. Interest may be stimulated by overstatement but it is dangerous to build a basis of interest on anything but facts since the platform so constructed must be used later. Political platforms are different.

It is also within the power of the good application man, to serve as a scout for the home team. He can bring back not only ideas for better design and efficiency with respect to his own products, but he may also discover unoccupied fields for new endeavor.

(4) Research. Research is the life insurance of business. Any industry which is merely holding its own has already slipped. The law of diminishing returns is at work day and night. In action it is as inexorable as fixed charges. No business should ever consider that it holds an impregnable position.

So much is written about research today as to create a danger that the public may come to regard it as an universal panacea for falling profits; a commodity to be purchased. If an executive were to believe all the inspirational articles he reads about research in the popular weeklies, we can imagine him going to Dr. Compton to obtain a carload of assorted technologists to be shipped f. o. b. Cambridge, Massachusetts to his home town.

Research is a plant of slow growth. Overstimulation may kill research. For direction there is required a man of outstanding planning ability, vast knowledge, great experience, and exceptional understanding of human nature.

Research is the "Elysian Fields of Technology." Here a man does what he would rather do than anything else and gets paid for doing it.

(5) Counsel. A generation ago bankers decided to be guided as much by moral as by financial risk in making investments. Today, when so much of the field of industry is occupied by technology, a third factor must be taken into consideration. A balance sheet is an historical document the day it is written. It cannot predict the future without help. Technologists are in a better position than accountants to predict trends. Companies manufacturing carriages and reciprocating engines were well managed but they could not continue to make those articles of commerce against the trend of the times. Industries disappear and new ones take their places. For instance today, powder moulding is displacing the light foundry. One company is ready to print your newspaper by radio in your own home while you sleep. Arrangements for an adequate news service, together with advertising questions hold it back. In the meantime the public questions the wisdom of putting money into newspapers. Bankers and investing insurance executives are calling upon technologists for their point of view in order to avoid the danger that obsolescence may overtake amortization.

Today, in addition to real and personal property there must be added intellectual property, in which class the most tangible values lie in patents. So valuable may they be that people steal them and they meet the final test because in many countries they are taxed. The technologist is frequently called upon to appraise their value and future earning power.

Of these five functions of the technologist, the first three, control, production, and application, employ the greater proportion of those working in the field. This proportion is perhaps eighty to ninety per cent. of the whole. It is evident that the five functions, which the technologist performs, involve every operation from the beginning, when a conception is nothing more than an intellectual product, through all stages of production and distribution until the original concept shall have been employed for useful purposes.

The Place of the Technologist in Industry

The five functions of the technologist, already discussed, involve every science from agronomy to zymology. This may sound complicated but to me the classification does not appear to be so difficult. Let us consider the place which technology occupies today in free countries, in which men may work and save, where because a man may own something for himself he is stimulated to action, a world in which all hope and ambition is not stifled by the drudgery and despair of regimentation. In these free countries we have in industrial production three estates, capital, technology, and labor. These three work together in a cycle and all are interdependent. Each is helpless unless the other two cooperate with it. It is a relationship which has evolved with the machine age. Into this cycle raw materials enter. From it emerge useful products, which can be sold. Only when the cycle operates smoothly and efficiently can the members which constitute the cycle be rewarded.

Capital provides the money for plant, equipment, and working capital. Unless put to work, money is useless and might as well be buried at Fort Knox. Stockholders elect a Board of Directors to represent their invested capital and appoint officers who constitute the management. Some boards are conscientious and far sighted; others perfunctory and windy. One of my friends who is the Chairman of a Board has placed the following clipping from "Tid-Bits" under the glass top of his Board Room table:

> "Father, what is a Board of Directors?"
> "My boy, it is a body of men who waste hours and keep minutes."

Technologists sit on many Boards of Directors and many are company officers. Of these there is a growing list of them who pay income taxes in the high brackets. The stock certificates representing paid-in capital may and often are held by technologists and by labor. When labor awakens to its money gathering powers it is quite possible that the unions may hold a position very much like that of insurance companies in the investment field. This contingency need not excite dismay, however, because under those conditions as unions become more powerful they will also be more conservative and more responsible.

The technologist is liaison officer between capital on the one hand and labor on the other. Every year sees more and more planning transferred to the technologist. In order that he may act as a liaison officer he must possess or acquire an ability to explain technical matters in a clear and understandable manner not only to non-technical executives, but to labor. This requires time, patience, and effort. Scientific men among themselves, to save time, use a language which is a variety of shorthand. To be understood, this shorthand must be translated. The president of a large chemical manufactur-

ing corporation once said to me, "You understand that I know no chemistry but my vice-president of development is able to explain to me the most abstruse project in a way I can understand."

Every technologist should cultivate the difficult art of expressing technical problems in a simple, clear, and brief English. Even where it is unnecessary to do this for others, we should do it for our own sake, because the test of simplicity is a criterion of straight thinking. Some technologists despair of clear exposition and take refuge in a reticence or hide within a cloud of technicalities. Another class is as over loquacious as the scientific butcher who felt called upon to explain the laws of gravitation to his customer every time he weighed a pound of steak.

It is, as a rule, not difficult to explain a technical detail to labor. The worker is familiar with the unit operations of production and because of daily association knows them. Mechanization has given him time to think. No longer does the possibility of profitable production depend upon the elastic limit of an Italian's back. In many cases the worker is not only intelligent but understanding and suggestive.

Reasonable men seldom disagree when they try to understand each other and speak the same language. Good will and plain speaking can accomplish much. Control by the destructive emotions has no place in the three phase cycle, but it has, unfortunately, wrecked many an industry. Table pounding by executives may lead to stone throwing by workers.

If the proverbial man from Mars were to make a survey of humankind, he would be likely to go back and report that we are congenital schizo-phreniacs. We cannot deny that man is handicapped by the dual nature of his personality. On one side there is his intellect with its great powers and possibilities. On the other side are his emotions which influence intellectual control. In the well balanced man the intellect and emotions cooperate. Justice is tempered with understanding and generosity exercised with justice. Utter lack of balance may follow control by the destructive emotions. When this becomes chronic, the case is pathological. Even here the intellect may still function but, under emotional control, may be employed for destructive purposes. This is also true of those aggregates of people we call nations, in which case war is pathological.

When we consider all the contradictions of humanity, we think that perhaps Lord Byron was right when he said, "What a strange thing is man and what a stranger is woman."

Under the control of lust for power, greed, hatred, and anger, man will destroy his own most noble creations. Under the reign of such noble emotions as good will, righteousness and consideration for others, comfort and well-being flourish. Historically, the only force in the world which has ever exerted any semblance of control over the destructive emotions has been religion.

Dean Inge views human inconsistency thus:

"Man has honored its destroyers and persecuted its benefactors, building palaces for living brigands, and tombs for long dead prophets."

The most striking case of the persecution of benefactors has occurred in Germany of recent years from which have been driven all those of Jewish ancestry. Germany has rather arrogantly boasted of her supremacy in the field of chemistry. I cannot read the list of outstanding chemists who, if they were all alive today, would be expelled. From a list of sixty-two men of international reputation, let me name these few: Von Baeyer, Caro, Frank, Ehrlich, Freundlich, Friedlander, Haber, Lunge, Victor Meyer, Wallach, and Willstatter.

The Place of the Technologist in Society

Man does not live by bread alone. The technologist has a place in society. To take this place he must be conscious of society and this involves a knowledge of, and liking for, people. The technologist must be a man of the world (and I do not mean by this a man about town). Poise, which is the ability to meet all situations with imperturbability, creates in a man self-confidence and in others respect. A sure sign of an inferiority complex is worry about dignity and dignity cannot be purchased at the sign of "the stuffed shirt."

Many of you will remember the old Scotch prayer, "Oh, Lord, give us a proper conceit of ourselves." I take this to be a prayer for self-respect and self-respect implies appraisal after the manner of the French philosopher who said, "When I compare myself I am proud. When I measure myself, I am humble."

Of all men the technologist should be the most modest because he is constantly reminded of his ignorance. Of all men he may be the most self-confident because his judgments are based upon facts.

The technologist is equipped by knowledge, by poise, and by familiarity with the world of activity to take his place in society. To do this he must not only see his opportunity but he must also accept his responsibility. The average technologist has been slow in relating himself properly to his fellow-men. His work is so interesting and his problems so absorbing that it is easy to become more interested in things than in people. Things and forces may be controlled and managed; they never talk back. On the other hand, when the technologist confronts humanity he is met with a paradox. The all-over character of human nature has changed little during the historical period, but individual human action is in a continuous state of flux. We may compare it to an electric cable carrying its proper load. It looks like a cold, dead thing. Really, it is alive and full of energy. When overloaded, it explodes.

In every country of the world, there are scientific and engineering organizations. The membership of each is made up of men devoted to the interests of a special branch of science and its development. Is it too much to expect that these national organizations together with their local branches might do something to engineer our civic and social life? Gratuitous advice leads to nothing, since an engineering report is commonly appraised by what it costs; but is it too much to expect that these existing organizations, by accepting their responsibilities as citizens, might do as much for civic efficiency as the Garden Clubs of America have done for civic housekeeping? While we have always sprung to attention at the bugle call of national emergency, we have not played a very good game on the home grounds. Politics, we have regarded as emotional conflicts between the "ins" and the "outs," where the merits of the situation become lost in a sea of words. In this way civic inefficiency comes to be regarded as a sad but inevitable concomitant of political control. The technologists' responsibility is to gear science to society and to put science and society into that state of synchronous vibration which we call harmony.

In times of emergency the technologist has always taken his place in national life. When we look back upon the history of civilization it would almost seem that the main occupation of man has been war. Periods of conflict have been followed by periods of peace during which life became easy. Ease begets false security and neglect. Neglect and false confidence render any nation an easy prey to a greedy and efficient enemy. It is to the credit of the technologist that during times of peace the technologist has seldom, if ever, been idle. In such periods machines, like the tractor and the plane, have been developed for the uses of peace. Because they fulfill a need, these instruments of peace become the engines of war. Today, every agency of modern warfare has been either produced or developed to its present terrible efficiency by technologists.

In defense we are all doing our utmost to match gun for gun, plane for plane, and tank for tank. To defend us from the flying terror of the night more than this is required. To provide that defense, the physicists of Anglo-Saxon countries

are toiling day and night to provide a new defense unknown to our common enemy.

In times of peace, Technology holds an important place in the executive side of Government. Legislators are delegating more and more authority to those technological branches of government which control, develop, or advise a civilization which has become so complicated that only a technologist can thoroughly understand the details thereof.

Every scientific and technological national society offers every resource of organization, knowledge, and personnel for the national good. Under the guidance of National Research Councils which may be a part of government or advisory adjuncts thereto, all the technological assets of our nations are being so inventoried and classified as to be instantly available for public use.

To Create Something Lasting

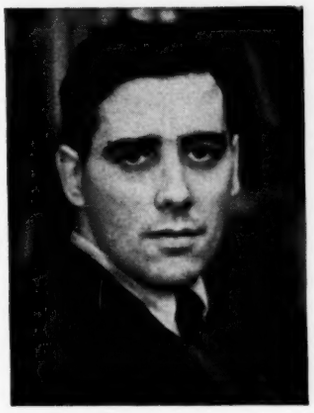
To create something lasting is within the power of each technologist. Every man has a desire to insure his own immortality and for this reason men endow colleges and erect buildings bearing their names. But the only monuments which endure through the centuries are the intellectual creations of art, literature, and science. Of these, science alone is cumulative, permanent, and self-propagating. Cities may be blasted to rubble, kingdoms and empires may perish, but science will live to rebuild the ruins. Wisdom cannot be passed down from father to son but the man who adds to the sum of human understanding has erected to himself a monument more lasting than bronze.

If we technologists are to take our places in our particular science, our part in the world of endeavor, and our places in society, with what mental and moral attributes must we be endowed? May I suggest a list of beatitudes for the technologist?

Fortunate is the man who is the possessor of knowledge without conceit, who can be energetic while preserving his equanimity, who has vision and foresight controlled by common sense. Strong is he who can lead with authority, command without dictating, and make haste without disorder. Happy is the man who can be friendly without familiarity, whose self-respect is free from self-esteem, who can criticise with justice and accept criticism with understanding.

Sir, I proclaim the technologist, I proclaim his opportunity, I proclaim his responsibility, I proclaim his place in society. Our place in the world depends upon ourselves.

"Honor and shame from no condition rise.
Act well thy part, there all honor lies."



Foreign Literature DIGEST

By

T. E. R. Singer

ZHURNAL KHIM. PROM (J. of Chem. Ind.) (USSR) XVII No. 12, p. 33-34 (1940).

Superphosphates—Soviet standards for superphosphate require that this material contain not less than 18.7% assimilable P_2O_5 and not more than 5.5% free P_2O_5. The superphosphates leaving certain Soviet plants had a too high content of free P_2O_5 and too low content of assimilable P_2O_5 and it was necessary to bring these contents to standards by extra measures. This was accomplished by addition of bone meal to the superphosphate while it was being loaded on the freight cars for shipping to the consumers. Laboratory experiments showed that the addition of 4% of bone meal to superphosphate which had been stored 10 days and contained 17.5-17.9% assimilable P_2O_5 and up to 8.5% free P_2O_5, produced a decrease in free P_2O_5 to 5.0-5.4% and an increase in assimilable P_2O_5 to 18.2% within 2 hours. The superphosphate and bone meal must be very thoroughly mixed.

The Molotov superphosphate plant had a large quantity of superphosphate which could not be shipped to the consumer because it did not comply with the standards required. Most of it had been stored 19 days on the average and it contained 17.9% assimilable P_2O_5 and 6.4-8% free P_2O_5, with a moisture content of 13-14%. The bone meal used contained 30% P_2O_5 and 40% CaO. It was calculated that 1.77 parts by wt. of CaO, therefore 4.4% bone meal, was necessary to neutralize 3% free P_2O_5. This adds 1.3 parts by wt. P_2O_5 to each 100 parts by wt. of the superphosphate. Since bone meal decomposes readily, the P_2O_5 contained therein goes over to the assimilable form. It must also be taken into account that the superphosphate decomposes somewhat on cooling and handling during loading and therefore increases the content of assimilable P_2O_5. The decrease of moisture in the superphosphate after addition of bone meal also increases the concentration of assimilable P_2O_5 in the superphosphate. All these calculations were found to be correct in actual practice. Samples were taken from some 30 places in the carload and analysis showed that the assimilable P_2O_5 contained varied from 18.5 to 18.8%, and the free P_2O_5 content did not exceed 3.3%. This superphosphate also had excellent physical properties—it was dry, crumbly, and it did not become sticky on compression, or form lumps during transportation.

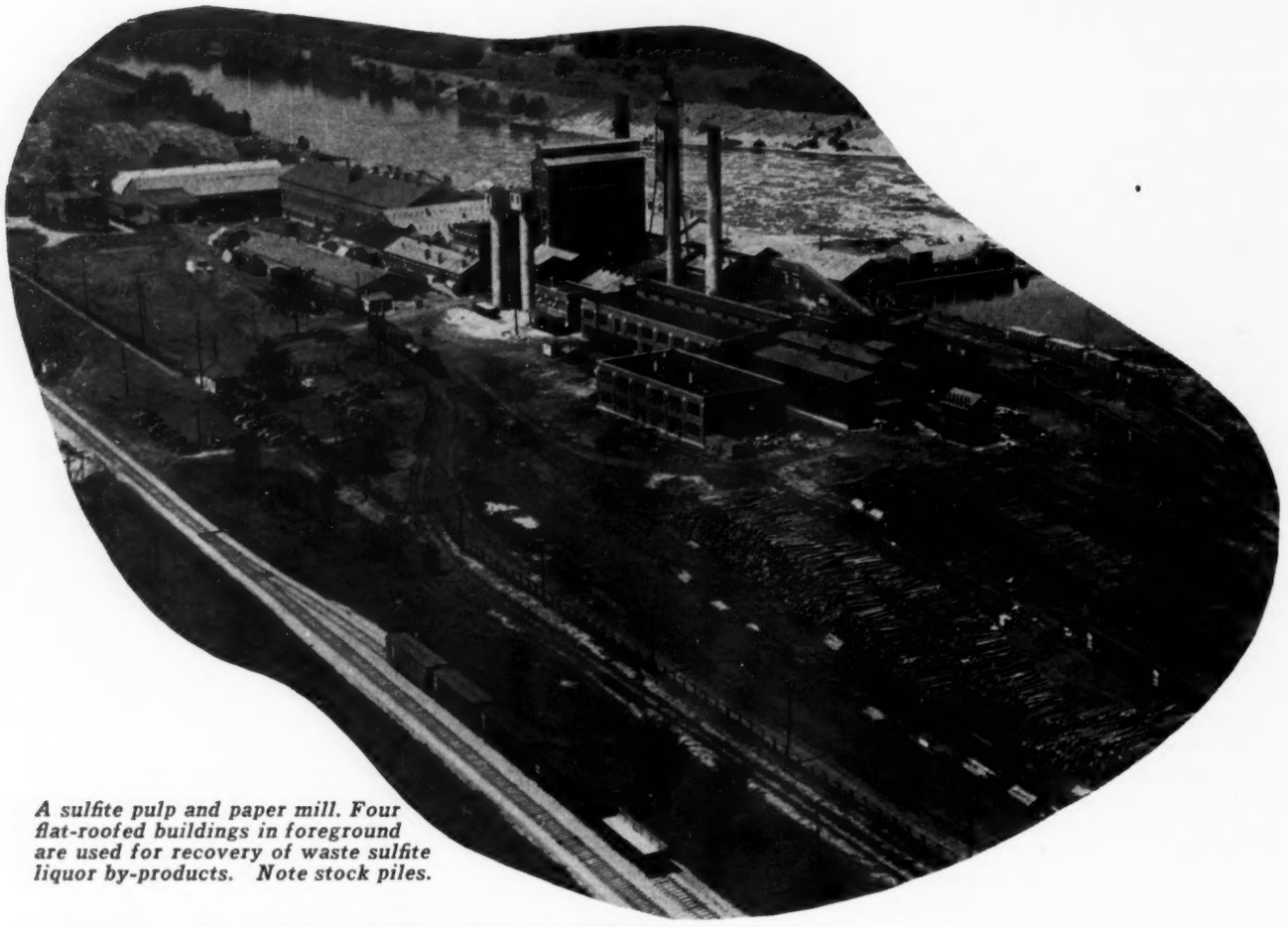
The superphosphate at the Voskresenski Chemical Combinat contained 16.7–16.8% assimilable P_2O_5 and 7% free P_2O_5. A 4.3% addition of bone meal lowered the free P_2O_5 to 4.7% within 2 hours, to 3.2% within a day, and to 2.9% within 2 days. The assimilable P_2O_5 rose to 17.5% within a day.

Only superphosphate which has been manufactured under fairly strictly controlled conditions and subjected to cooling and mixing can be brought to standard contents of assimilable and free P_2O_5 by addition of bone meal during loading. Less carefully prepared superphosphate (with no cooling or mixing) cannot be standardized by addition of bone meal during loading. The addition of bone meal will improve the chemical composition but standard contents can be attained only on delivery to the place where it is to be used. Supplementary decomposition occurs in this superphosphate during transportation.

ZHURNAL PRIKLADNOI KHIMI (J. Applied Chemistry) Vol. XIV, No. 1, p. 120-6 (1941).

Recovery of Gases in the Manufacture of Viscose Rayon and Cellophane—In the manufacture of viscose rayon, cellophane and staple fiber a large quantity of injurious gases is given off which must be recovered chemically as mere ventilation is not sufficient precaution against them. Most chemical methods for their recovery are chiefly for use when only hydrogen sulfide is present in the atmosphere. M. S. Tarmakovski of the Moscow Mendeleev Chemico-Technological Institute reports on methods used in industry but not applicable to the particular conditions under consideration, and on methods experimentally tested by this institute, one of which is especially interesting both in

(*Continued on page 760*)



A sulfite pulp and paper mill. Four flat-roofed buildings in foreground are used for recovery of waste sulfite liquor by-products. Note stock piles.

BY-PRODUCTS
of the Paper Pulp Industry

By Guy C. Howard

Consulting Chemical Engineer, Marathon Paper Mills Co., Wausau, Wisconsin

The author has discussed and classified by-products inherent in the manufacture of paper pulp. At present, only a small percentage of the organic materials available in waste sulfite liquors is being recovered commercially but the potential tonnage at sulfite paper mills is tremendous and favorably located for beneficial utilization.

PAPER pulp is very largely made from ligno-cellulose as the raw material and to a minor extent from cellulose materials such as cotton rags and linters. Ligno-cellulose is the structural element of plants and is the major constituent of the stems, branches and roots of trees, straws, and other vegetation. It may be regarded as a systematic mechanical mixture of cellulose, hemi-cellulose and lignin substances which are probably chemically bound together to some extent.

For economic reasons wood is by far the predominant raw material used in the manufacture of paper pulp. It is made up largely of the cellulose, hemi-cellulose and lignin substances, constituting the ligno-cellulose, together with various constituents in minor amounts such as resins, fats, proteins and coloring matter.

The cellulose is a carbohydrate substance in large molecular units or polymers which constitutes the desired chemical paper pulp. The hemi-celluloses are likewise carbohydrate substances but exist in forms more easily altered to soluble products. The lignin component is believed to be a cyclic compound of largely aromatic nature in highly polymerized form and built up from units containing methoxyl and phenolic groups.

The purpose of the chemical pulping processes is to recover the fibrous cellulose in as pure a condition as practical hence in such processing the hemi-celluloses, lignin and minor constituents are largely dissolved and pass into the spent cooking liquors or are carried in minor amounts as volatiles with escaping steam. The spent cooking liquors therefore con-

Below, reaction tanks for precipitation of sulfite liquor.

tain practically all of the non-cellulose constituents of the wood used.

Pulping Processes

The manufacture of paper pulps divides into the making of mechanical, semi-chemical and chemical pulps. The mechanical pulp is a ligno-cellulose-containing pulp made by grinding wood on a revolving stone to a fibrous product without dissolving any material amount of the wood substance or using chemicals, hence does not permit of the recovery of commercial by-products.

The semi-chemical pulps are made by pressure cooking (digesting) wood or other ligno-cellulose material with chemicals to a sufficient extent to convert it, either with or without auxiliary mechanical treatment, to a pulp still containing substantial amounts of hemi-celluloses and lignin. The pulps resulting from the cooking of straw with caustic lime or the partial cooking of wood by special processes are examples of semi-chemical pulp. The recovery of by-products from the making of such pulp is not ordinarily practiced nor economically attractive. The common practice of extracting the tannin content of chestnut wood and converting the spent chestnut chips into a semi-chemical pulp might be considered an exception but in this the pulp rather than the tannin is the by-product.

The chemical pulps are made by digesting wood or other ligno-cellulose material with chemicals to dissolve substantially all the hemi-celluloses, lignin and minor constituents and give a relatively pure cellulose pulp. They are made by alkaline treatments such as the soda and sulfate (Kraft) processes and by acid treatments such as the usual sulfite process. Minor amounts are also made by the neutral sulfite and other special processes.

Soda and Sulfate Pulps

These are chemical pulps made by digesting wood chips with an alkaline cooking liquor which is essentially a dilute solution of caustic soda in the case of soda pulp and a solution of caustic soda and sodium sulfide in making the sulfate pulp. By such treatment the hemi-celluloses, lignin and minor constituents of the wood are dissolved in the cooking liquor and leave the cellulose in more or less pure form as a fibrous pulp. Only minor amounts of organic matter are contained as volatiles in the escaping steam during the discharge of the digesters.

The hemi-celluloses exist in the spent liquor—called black liquor—mainly as sodium salts of various organic acids since they have been broken down to soluble acid derivatives and the simple sugars destroyed by the hot alkaline treatment. The lignin exists as its soluble (dispersible) sodium salt and the resins and fats as their sodium soaps.

The recovery of commercial by-products from the hemi-cellulose and lignin constituents of these black-liquors is not ordinarily attempted. The usual practice is to concentrate the black liquors from the soda and sulfate processes by evaporation and burn the lignin and other organic matter in them to generate steam and recover the soda chemicals from the resultant ash for use again in making fresh cooking liquor. The lignin can, however, be precipitated from these alkaline black liquors by treatment with acids and one mill in this country is equipped to recover lignin from its soda black liquor by this procedure on a small commercial scale. The recovery of organic acids, acetone and other organic products from black liquor has been proposed but is not being done on a commercial scale as far as known. Aside from the recovery of lignin in limited amounts as referred to above the only organic by-products from the soda or sulfate black liquors are "tall oil" and "activated carbon."

Recovery of Tall Oil

The crude tall oil is a mixture of fatty acid and rosin soaps with various minor constituents which is insoluble and comes to the surface when the black liquor from sulfate pulp made from pine and other resinous woods is allowed to stand. It is skimmed off and refined into marketable products. Few mills in this country recover the tall oil but it is recovered at most sulfate mills in the Scandinavian countries and utilized as a source of fatty acids and rosin as well as for special purposes.

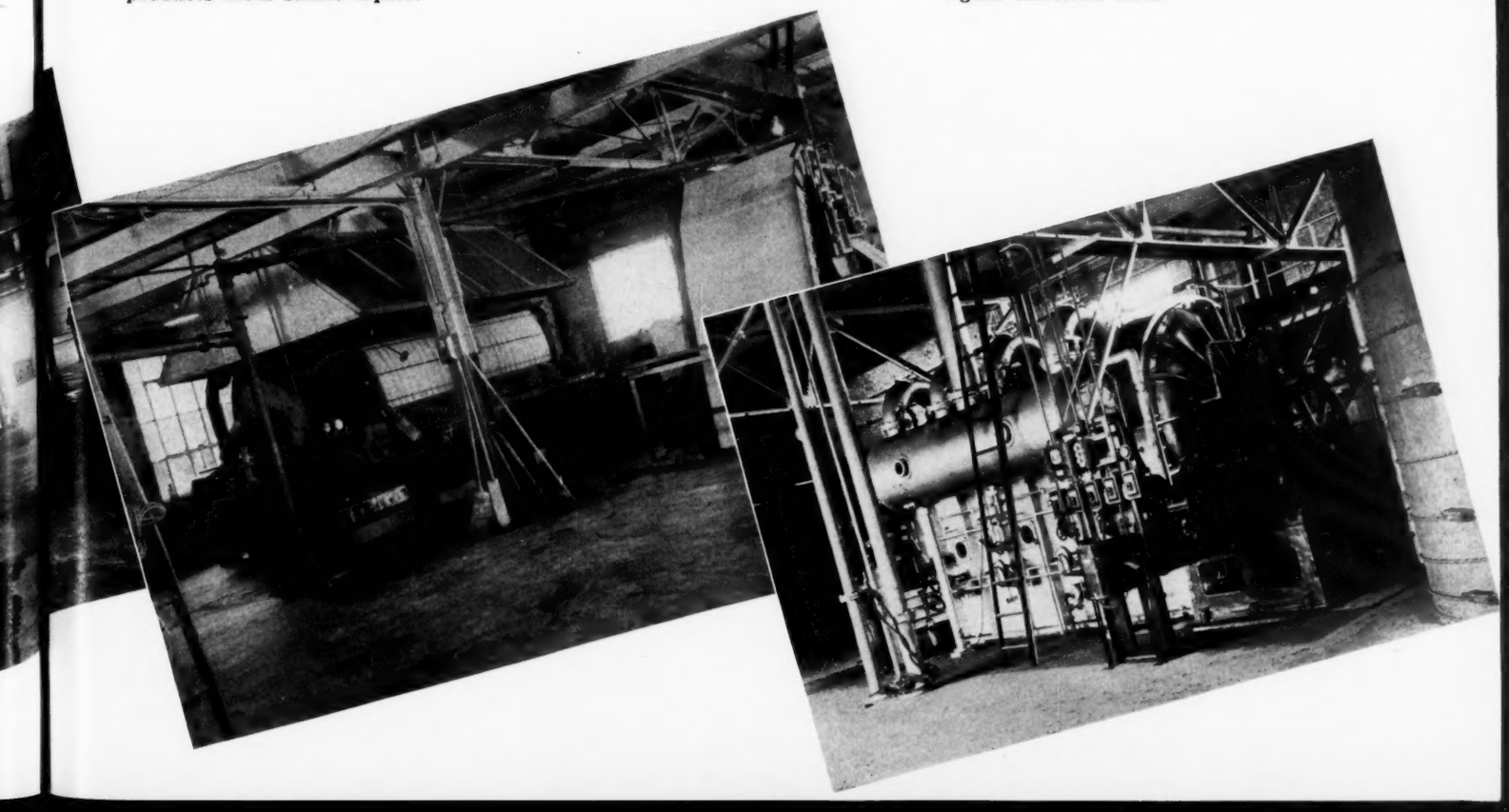
The activated carbons are made from the carbon remaining in the ash gotten by burning the black liquor from soda pulp. This ash contains sodium carbonate and other soluble sodium salts together with some unburned carbon. The soluble salts are leached out for re-use and the residual carbon is processed further into marketable grades of activated carbon for sundry uses.

Sulfite Pulp

This is a chemical pulp made by pressure cooking wood chips with an acid

Below, rotary vacuum filter and dewatering press for recovery of lignin products from sulfite liquor.

Below, vacuum drum drier for drying lignin sulfonate salts.



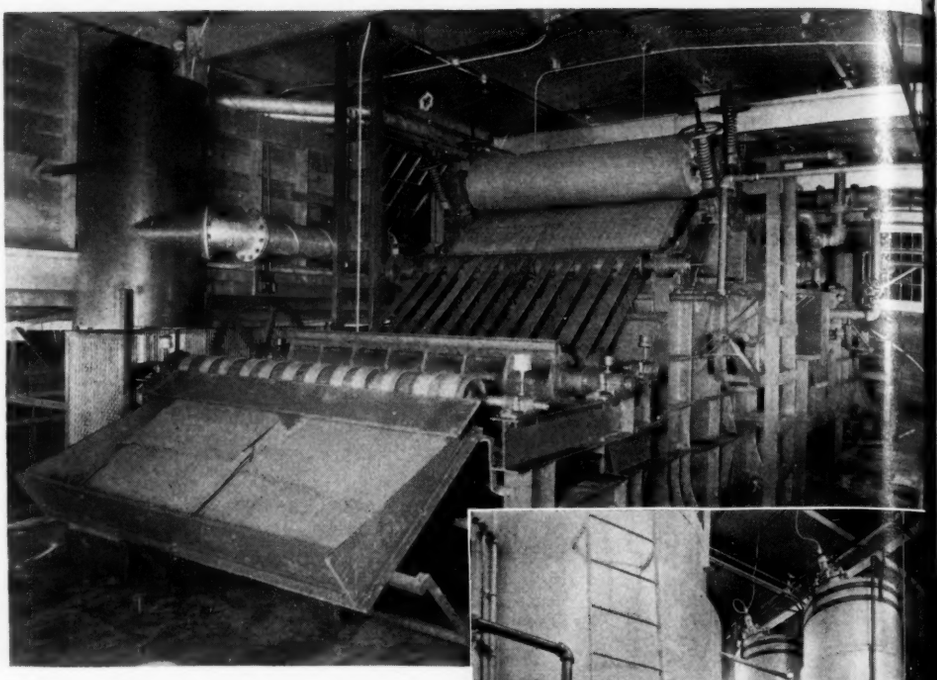
cooking liquor which is usually and essentially a solution of calcium bisulfite (or mixed calcium and magnesium bisulfite) and free sulfurous acid. By such treatment the hemi-cellulose, lignin and minor constituents of the wood are dissolved into the spent cooking liquor or are contained in minor amounts as volatiles in the steam escaping during the discharge of the digesters and the cellulose constituent remains as a fibrous pulp.

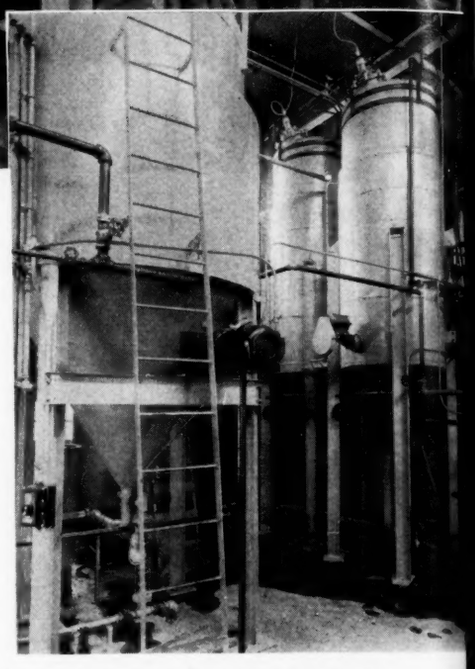
The hemi-celluloses exist in the spent cooking liquor called waste sulfite liquor —as soluble hexose, pentose and other sugars and as soluble calcium and magnesium salts of organic acids derived from them. The lignin constituent of the wood has been sulfonated in the cooking process to a degree sufficient to solubilize it and exists in the waste sulfite liquor as a calcium or magnesium lignin sulfonate. The resins, fats and other minor constituents are largely dissolved in the spent cooking liquor but are to some extent retained on the cellulose pulp, hence non-resinous woods are preferred for the sulfite process.

The waste sulfite liquor is usually run to the sewer without the recovery of any by-products from it. The value of the calcium and magnesium content is not enough to necessitate their recovery for re-use as is done with the soda and sulfate black liquors by concentrating and burning to recover the sodium. Furthermore the treatment of the sulfite liquor in such manner is handicapped by its acid character and other unfavorable properties. If, however, a soda or straight magnesia base cooking acid is used—as has been proposed and tried in a few mills—the recovery of the base becomes necessary.

Use as a Boiler Fuel

The nature of the constituents and the large tonnage of organic substances contained in waste sulfite liquors invites commercial utilization of them and especially since their discharge into waterways involves pollution to a more or less serious extent depending on the size of the pulp mill in relation to the flow in the waterway. The only use now in sight for the organic matter in these sulfite liquors that is at all commensurate with the very large tonnages contained in them is its use as a boiler fuel at the pulp mills. Methods for the disposal of these liquors to avoid stream pollution and applicable to all pulp mills are therefore at present limited to methods which are premised either on the recovery and use of the organic matter as a fuel by the pulp mill or on finding some inexpensive treatment of the liquor which removes its stream pollution characteristics without removing material amounts of its organic matter content. The recovery of organic by-products (other than for use as fuel) is economically limited by the market out-





Above, equipment used in making lignin plastic products.

let for the recovered products and while substantial amounts of by-products are now being recovered from sulfite liquor they constitute only a small fraction of the amount potentially available in such liquors. The by-products are now being recovered by a variety of procedures such as evaporation, fermentation, and precipitation of the spent sulfite liquors and by condensation of volatiles escaping with steam.

Evaporation

A number of mills in this and other countries evaporate waste sulfite liquor to concentrated liquid or dry powder products and market them for sundry uses. This is economically limited to the evaporation of only the more concentrated liquors as they drain from the pulp in the blow pits and usually involves neutralization of the acidity prior to evaporation. It may optionally involve changing the liquor from its original calcium base system to a magnesium, sodium or other desired base by double decomposition reactions. Also the sugar constituents may be reduced to some extent by yeast fermentation or other biological treatments prior to the evaporation. In any event the liquid or dry powder products resulting from the processing of waste sulfite liquor by evaporation are products containing all or the major portion of the original constituents of the liquor and hence are impure products as regards either of the main constituents, namely carbohydrates and lignin substances. Products of such mixed composition are, however, commercially useful for many purposes and are made and marketed in substantial amounts for use in

Above, equipment for refining lignin vanillin from sulfite liquor by-products. Above right, other page, equipment for extracting lignin vanillin from sulfite liquor by-products.

tanning leather, as core binders in foundries, for road dressing, in linoleum pastes and other adhesives, as dispersing and emulsifying agents, in detergents, as protective colloids, and for sundry other purposes.

Fermentation

The waste sulfite liquors carry large tonnages of carbohydrate substances of which a considerable proportion is in the form of simple fermentable sugars. All the carbohydrate substances constitute energy food for the growth of bacteria and substantial amounts of the simple sugars are fermentable with yeast to yield alcohol Practically all the sulfite pulp mills in Germany and many in the Scandinavian countries recover alcohol as a by-product by fermentation of the sugars in sulfite

liquor but very little if any is now being so produced in the United States or Canada, since it normally can be produced at lower cost by fermentation of molasses or made synthetically from other available materials. One or more mills in European countries and two mills in Canada are now making yeast products by fermentation of the sugars in sulfite liquor but such yeast products are not being made at present in this country. Aside from molasses, however, the sulfite liquors are probably the most economical tonnage source of fermentable sugars available in this country but with sugars made by acid-hydrolysis of waste wood and agricultural crop wastes as competing sources.

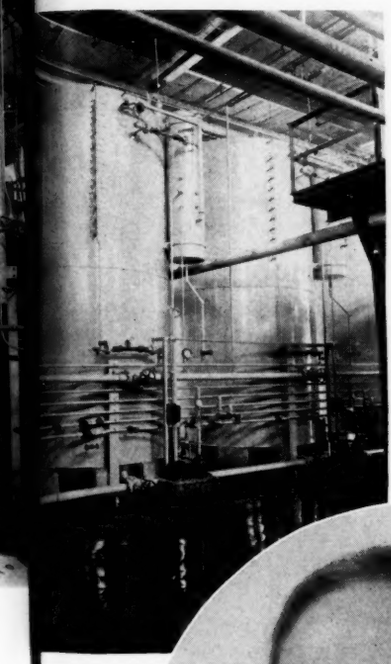
This article is one in the series "Wealth from Waste" describing how America is turning its waste materials into profitable channels, eliminating considerable stream pollution and unsightly piles of refuse.

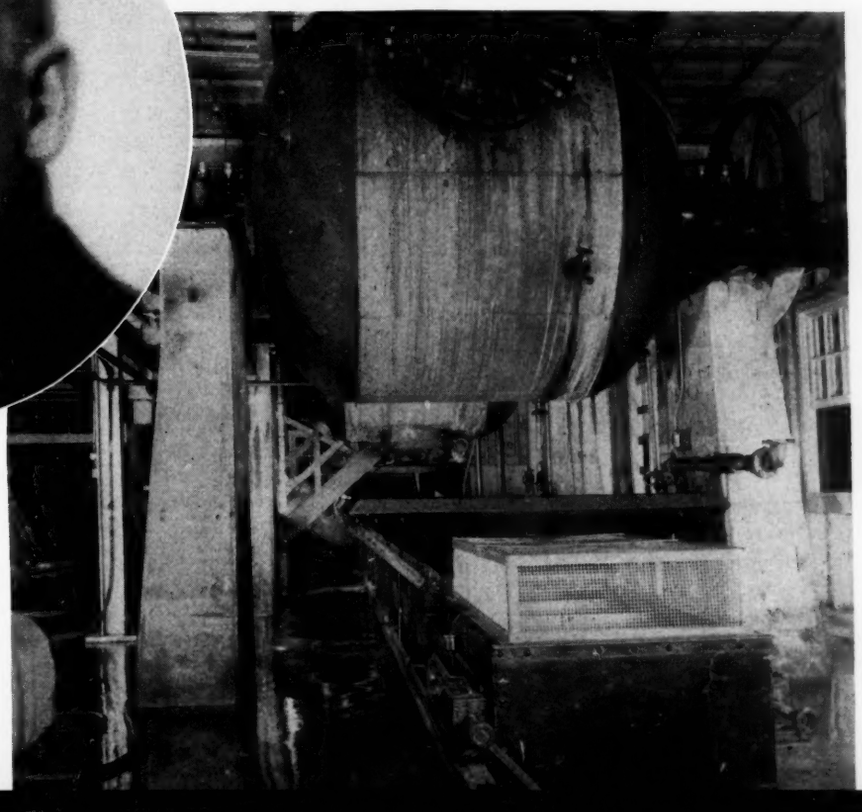
Precipitation

At one mill in Wisconsin the sulfite liquor is being commercially processed by progressive precipitation with caustic lime under specially controlled conditions. By this procedure the lignin and carbohydrate constituents of the liquor are more or less completely segregated thereby yielding products of higher purity and otherwise facilitating the commercial utilization of the various components of the liquor as well as yielding a process effluent having a greatly reduced stream pollution effect as compared with the untreated liquor. The lignin is recovered as a basic calcium lignin sulfonate in the form of a filter cake and the carbohydrate substances remain in the filtrate from the precipitation of the lignin. The recovered calcium lignin sulfonate is dried and marketed for various purposes or is converted by supplemental processing into other lignin sulfonate salts or into derivatives of lignin sulfonates. The carbohydrate substances in the filtrate liquors are made up largely of various organic acids derived from the hemi-celluloses of the wood. These organic acids are potentially recoverable but this is not being done at present on a commercial scale. Prior to the precipitation treatment the sulfite liquor can optionally be fermented for the production of alcohol or yeast products but this is not being done commercially at this time. Such yeast fermentation is not possible, however, after the precipitation treatment since the fermentable sugars in the sulfite liquor have been altered by the alkaline precipitation process but the carbohydrate substances in the effluent are still available as energy food for bacteria.

The lignin sulfonates as thus made are amorphous compounds of high purity, being practically free from reducing sugars and other non-ligneous organic matter and are commercially available as the salts of most metals. Their commercial utility results primarily from their purity, favorable physical and chemical characteristics and their adaptability to diverse use requirements. They are finding use as tanning agents, for conditioning boiler waters, in treating clays, for compounding rubber, as dispersing and emulsifying agents, for mordanting and leveling dyes, as grinding aids, in detergents, as protective colloids, for making free lignin sulfonic acid and as a starting material for various derivatives of lignin sulfonate compounds.

The derivatives of these lignin sulfonates now being made on a commercial scale are vanillin and plastic lignin resin products. The vanillin is made by an alkaline processing of lignin sulfonate followed by extraction with an organic solvent and final purification. The excellent quality of the lignin vanillin so made has been fully established and a large portion of the vanillin consumed in this country is now made at this Wisconsin pulp mill from the precipitated lignin sulfonate. In addition some lignin vanillin is made at a mill in Canada by processing the whole waste sulfite liquor





Above, Guy C. Howard, author of the article. Right, equipment used in making lignin plastic products.

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rather than from the precipitated lignin sulfonate. The plastic lignin resin products are now being made from the spent liquors of the vanillin process but can be made direct from the lignin sulfonate compound. They comprehend both lignin resin products for use with phenolic and other resins in molding compositions and as impregnating varnishes in making laminated sheets and lignin enriched pulp products for use in making laminating sheets or for felting into shapes to be molded or for use in molding compositions.

Volatiles

The only organic by-product being recovered from the steam escaping from the sulfite cooking processes is a so-called "spruce turpentine." This is an oil which comes to the surface of the steam condensate and can be collected. It contains substantial amounts of cymene, especially when spruce wood is being cooked, and can be recovered as a pure product by fractional distillation of the crude product. Its market is limited to a few special uses and it is not ordinarily recovered at pulp mills in this country.

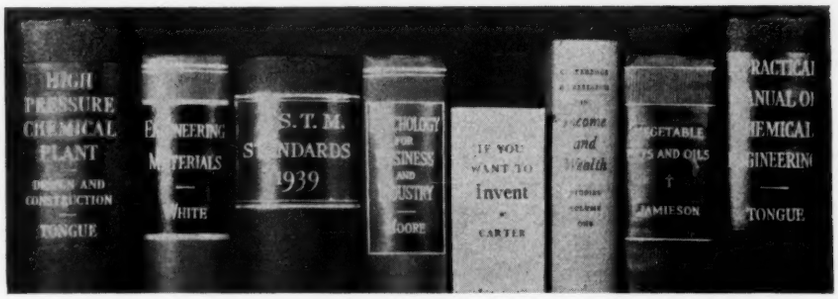
Summary

The spent cooking liquors from the making of paper pulp contain large tonnages of lignin and carbohydrate substances and are favorably located for utilization.

The organic substances contained in the black liquors from making soda and sulfate pulps are now quite fully utilized as a fuel by-product in the processing of the black liquor for recovery of inorganic constituents for re-use in making cooking liquor.

Source of Lignin Products

The waste sulfite liquors resulting from the making of sulfite pulp are a potential source of lignin products in the form of lignin sulfonate compounds and derivatives thereof, of alcohol and other products made by fermentation of the sugars contained in such liquors and of various organic acids. Lignin, alcohol and other by-products are now being recovered commercially from the sulfite liquors but only to the extent of a small fraction of the large tonnage of organic materials available in them. The waste sulfite liquors resulting from the world's production of sulfite pulp contain around 5,000,000 tons of lignin substance, 2,500,000 tons of simple reducing sugars and 1,700,000 tons of organic acids per year and about 40 per cent. of this is available at sulfite pulp mills in the United States and Canada.



The Industry's Bookshelf

Fluorescent Light and Its Applications, by H. C. Dake and Jack De Ment, Chemical Publishing Co., 256 pages, $3.00. The phenomenon now known as fluorescence was first termed *epipolic dispersion*, because the maximum strength of the color appeared to originate from the surface. Sir George Stokes, using green fluorite from Cumberland Moor, England, for his experiments in 1852 disliked the cumbersome phrase "true inner dispersion" then used, and because fluorite exhibited the phenomenon so markedly, suggested the term fluorescence, a suggestion which met with immediate and permanent approval. All the foregoing is from Chapter One of the book and is the means by which the authors introduce their fascinating topic.

Over a century of work by many minds and many hands has gone into the subject of luminescence and it's all to be found in this volume. The aim of the writers has been to present chapters to cover a wide range of readers and applications. Since luminescence and uses of ultraviolet light are rapidly finding more and more practical applications, the chapters pertaining to theoretical considerations and types of ultraviolet units will be found useful in many fields. One does not have to be a professional scientist, however, to find the book uniquely interesting.

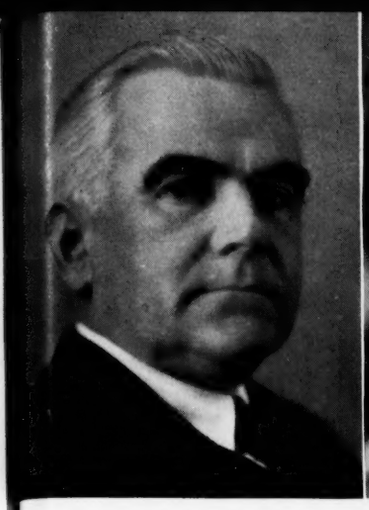
The bibliography is tremendous and gives those who want it a chance to obtain additional and detailed data in specific fields from original sources. Eleven chapters of the book are set up as follows:

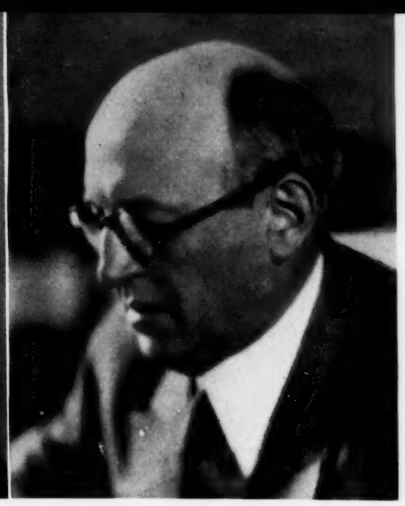
(1) Historical Aspects of Luminescence. (2) Radiation—Color—Perception. The eye. (3) Types of Luminescence. Thermoluminescence; Cathodoluminescence; Triboluminescence; X-Ray Luminescence; Electroluminescence; Crystalloluminescence; Pyroluminescence; Chemiluminescence; Bioluminescence; Other Forms of Luminescence. (4) Theory of Luminescence. Phosphors; Mechanism of Luminescence; Decay of Phosphorescence; Concentration Effects; Polarized Fluorescence; Other Influences on Luminescence; Mineral Activators. (5) Methods of Examination and Technic. General Considerations; Exposure of the Specimen; Color; Intensity; Duration of Phosphorescence. (6) Sources of Ultraviolet Radiations. Construction of an Iron Arc; Portable Units; Protection against Radiations; Filters for Fluorescence; Chemical Filters; Glass Filters; Heat Resisting Glass Filters; Non-Heat Resisting Glass Filter; Observing Fluorescence — Glasses; Tests of Wave Lengths; Test Glasses; Test Minerals. (7) The Fluorescent Minerals. Some Noted Localities; Fluorescent Minerals; Luminescence of Minerals; Uranium as an Activator; Thorium Meteorites. (8) The Radioactive Minerals. Uranium Minerals. (9) Luminescence of Gems. Fluorescent Gem Collections. (10) Some Notable Fluorescent Collections. Museum Collections; Private Collections; Fluorescent Fireplace Construction. (11) Uses of Ultraviolet Light. Antiques—Ceramics—Glass—Art Objects; Bactericidal Ultraviolet Radiation; Chemistry; Criminology; Fluorescent Lighting; Medicine and Biology; Microscopy; Mining and Prospecting; Pharmaceuticals; Theatrical Applications.

The Chemical Action of Ultraviolet Rays, by Carleton Ellis and Alfred A. Wells, Reinhold Publishing Corp., 961 pages, $12.00. This is a revised and enlarged edition of the familiar work of Ellis and Wells by Francis F. Heyroth, M.D., Ph.D., University of Cincinnati, which has grown out of the common need of workers in theoretical and industrial chemistry, biology and medicine for a modern reference work on photochemistry. In his preface Dr. Heyroth explains that certain explanatory chapters regarding the modern viewpoint have been added for readers who may not have had the advantage of recent advanced courses in physical chemistry. These chapters (1, Nature of Ultra-

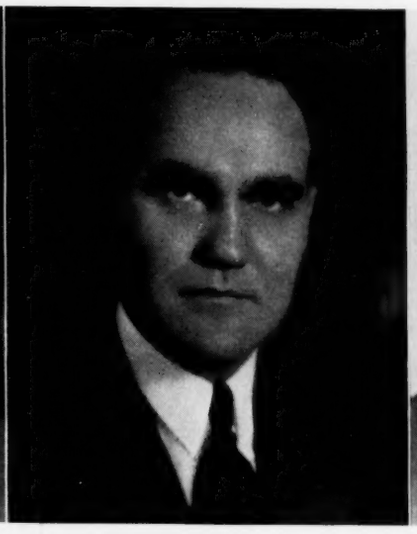
(*Continued on page 785*)

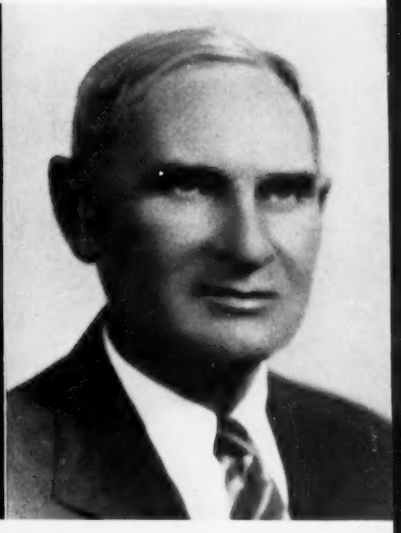
"Headliners" In the News





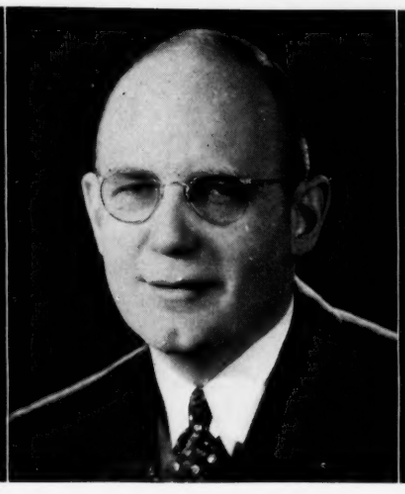
Left, Corner, Benjamin O'Shea, formerly vice-president of Union Carbide & Carbon who was named president and Jesse J. Ricks, formerly president who is now chairman of the board following an election meeting of the board of directors last month. Both the new president and chairman have been with the corporation since its formation in 1917.





Right, three newly-elected directors of Hercules Powder. (l to r) Petrus W. Meyeringh, vice-president and member of the company's executive committee; Albert E. Forster, general manager, Naval Stores Department; and Luke H. Sperry, chief engineer.

Professor Ralph H. Muller, Washington Square College, NYU, who has been elected chairman of the New York Section of the American Chemical Society.



Lee H. Hill, formerly assistant manager of the electrical department of Allis-Chalmers, who has been elected vice-president in charge of the Industrial Relations Dept.

Barney Castor, newly-appointed direct factory representative on the West Coast for National Engineering Co., Chicago, Ill.

Robert R. Cole, general manager of Monsanto's phosphate division, who was elected a vice-president of the company last month.

Right, Bertram Ellis, son of the late Carleton Ellis, who assumes the presidency of Ellis Laboratories, Inc., Montclair, N. J., following reorganization proceedings. Dr. C. F. Rassweiler, newly-appointed director of research of Johns-Manville Corp. He was a director of the Philadelphia laboratory of du Pont. V. P. Rumely, who has been named vice-president in charge of manufacturing of the Crane Co., Chicago.

MERCK IODIDES

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Assembling orders in the Shipping Department of Merck & Co. Inc. at Rahway, N. J.

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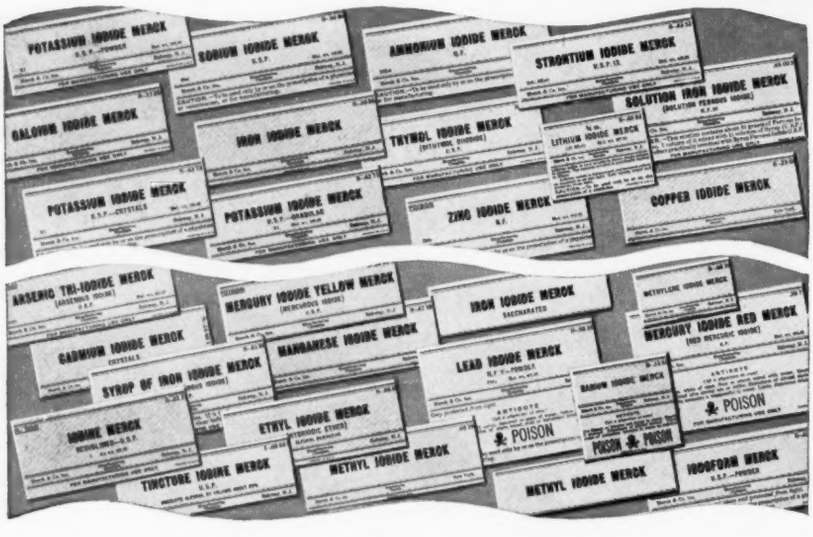

Some of their many uses may be found in the prophylaxis and treatment of certain forms of goiter, in bronchial asthma, subacute and chronic bronchitis, arteriosclerosis, actinomycosis, for promoting the elimination of mercury and lead, as an adjunct in the treatment of syphilis, and locally in the form of thymol iodide.

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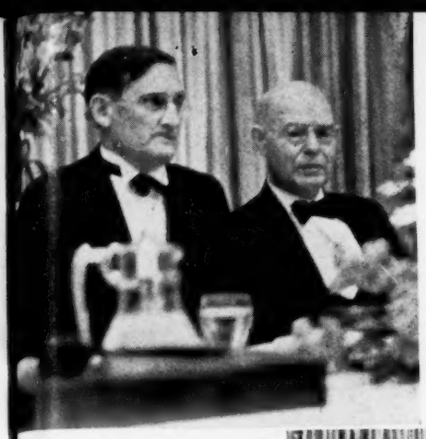
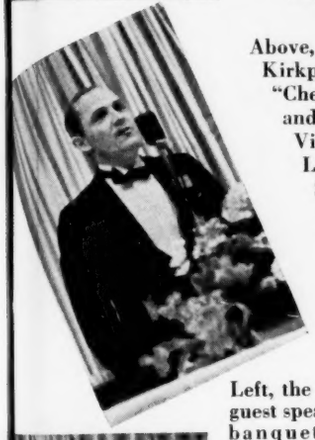
CHEMICAL ENGINEERS AT CHICAGO

Chemical engineers, industrialists, federal and state officials and leaders of the teaching profession gathered in Chicago on May 19-21 at the Edgewater Beach Hotel for the 33rd Semi-Annual Meeting of the American Institute of Chemical Engineers. Symposium on National Defense featured the meeting.



Left, Dr. Francis C. Frary, Director of Research of the Aluminum Co. of America, and President of the A. I. Ch. E., and Prof. H. McCormack, Illinois Institute of Technology, and Honorary Chairman of the Meeting. Below, Alfred J. Stamm, Forest Products Laboratory, Madison, Wisc.

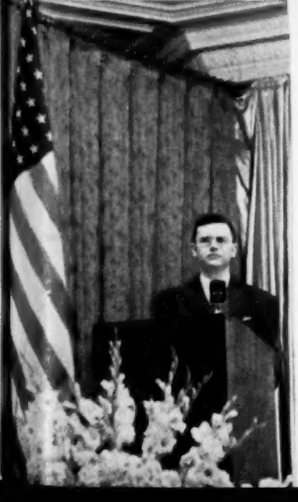
Above, Prof. John J. Schommer, Illinois Institute of Technology, and Mrs. Robert I. Wishnick. Right, Robert I. Wishnick, President, Wishnick-Tumpeer.



Above, left, Sidney Kirkpatrick, Editor, "Chem. & Met." and A. I. Ch. E. Vice President. Left, Prof. T. K. Sherwood, M.I.T., and recipient of the William H. Walker Award.

Left, Byron Marquis, Hardy Metallurgical, and Frank J. Breyer, Singmaster & Breyer. Below, right, Robert L. Murray, Director of Development, Hooker Electrochemical.

Left, the "mystery" guest speaker at the banquet. Below Prof. C. C. Furnas of Yale.



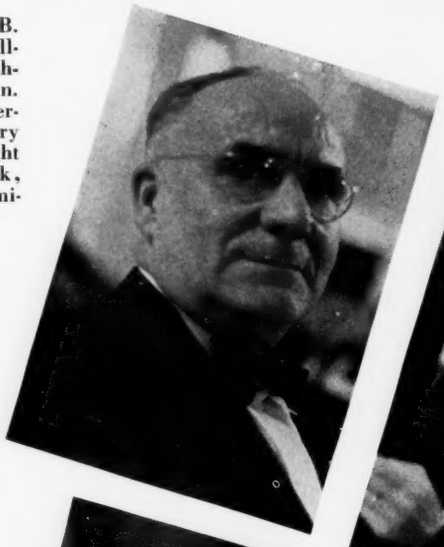
Above, Prof. Alfred H. White, University of Michigan, chats with Dr. Gustav Egloff, Director of Research, Universal Oil Products, and Chairman of the Symposium in Defense.

Left, D. F. Wilcock. The Sherwin-Williams Co. Right, F. M. Anable, Victor Chemical K. M. Watson Universal Oil Products, and General Chairman; and H. Adler, Victor Chemical.

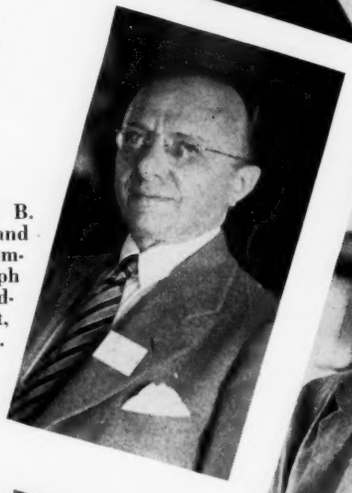
ADVERTISING PAGES REMOVED

Chemical Engineers at Chicago (continued)

Left, Prof. Donald B. Keyes, University of Illinois, and Prof. O. Eshback, Northwestern. Right, Martin J. Kermer, Buffalo Foundry & Machine. To his right Lauren Hitchcock, Hooker Electrochemical.



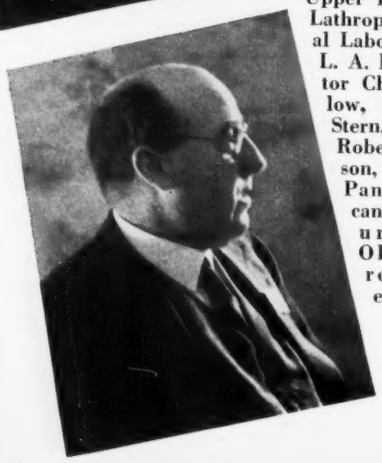
Left, Stephen L. Tyler, A.I.Ch.E. Secretary and F. C. Flint, Hazel Atlas Glass.



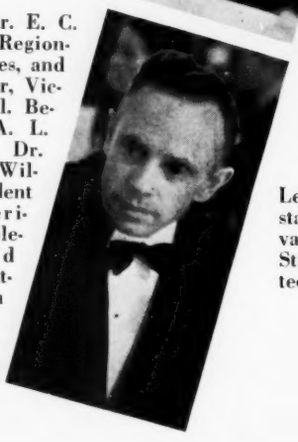
Left, H. Merriam, E. B. Badger & Sons Co., and O. C. Cessna, Dow Chemical. Right, Dr. Joseph Minevitch, E. B. Badger & Sons Co. Right, Below, Prof. A. H. White, University of Michigan.

Left, Paul G. Marsh, Monsanto. Left, C. P. Davis, American Cyanamid. Directly below, Guy C. Howard, Chemical Engineering Consultant.

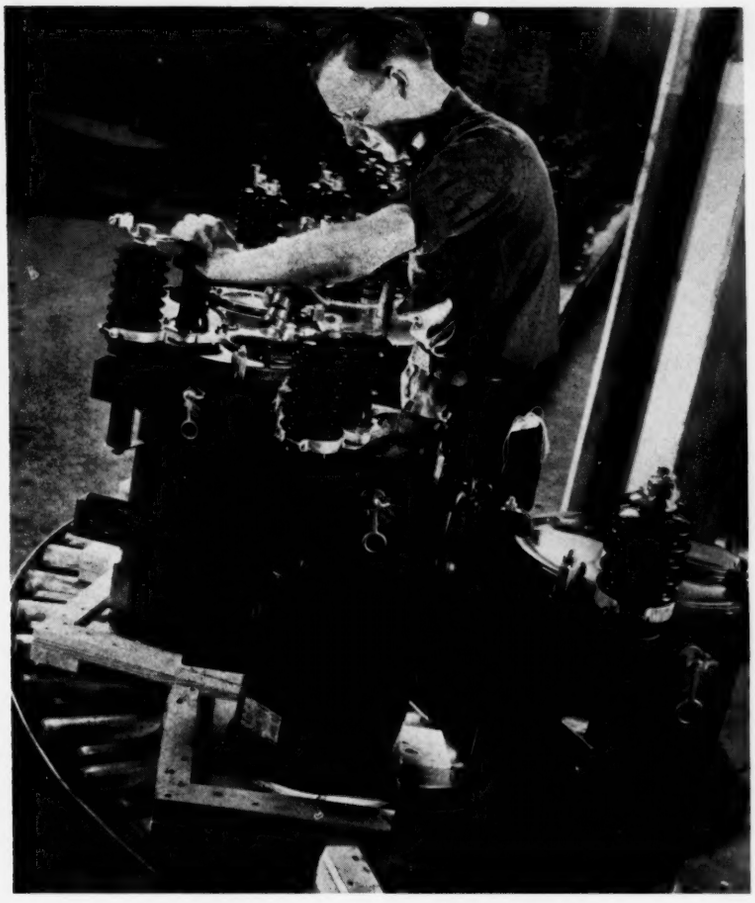
Left, Prof. Melvin C. Molstad, University of Pennsylvania, and Chairman of the Students Chapters Committee.



Upper left, Dr. E. C. Lathrop, U. S. Regional Laboratories, and L. A. Kramer, Victor Chemical. Below, left, A. L. Stern, and Dr. Robert E. Wilson, President Pan-American Petroleum and OPM petroleum expert.



PLANT OPERATION AND MANAGEMENT



Hipersil, an Improved Magnetic Steel

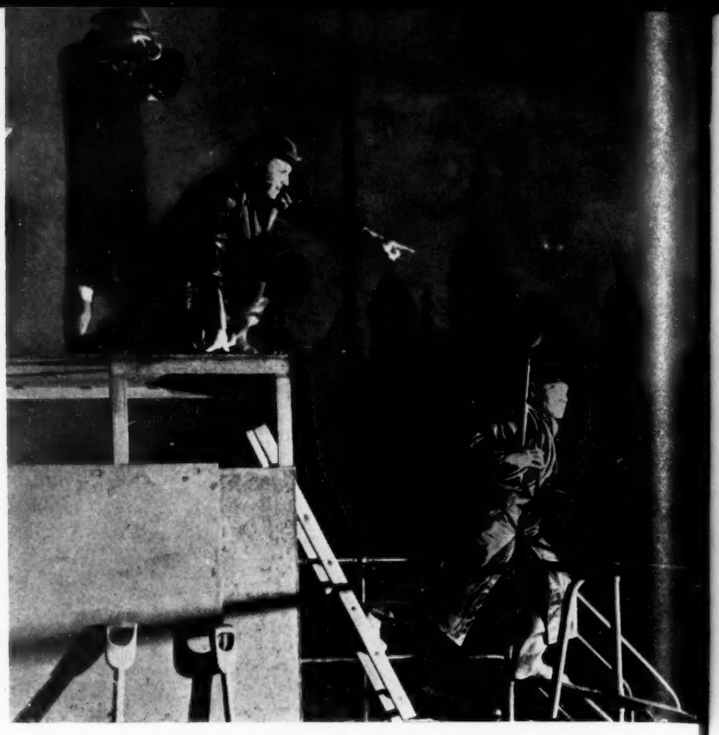
Westinghouse recently announced its newest offspring of industrial research, Hipersil—an improved magnetic silicon steel produced by a special technique—which used in transformer cores has one-third better flux-carrying capacity than conventional silicon steel. Pictured above is final checkup before transformers are tested electrically.

A DIGEST OF NEW METHODS AND EQUIPMENT FOR CHEMICAL MAKERS

CHEMICAL INDUSTRIES

Training of more workers in fire safety techniques and provision of additional protective equipment are among the plans of the new Office of Civilian Defense for industrial fire defense in the U. S. A vast cooperative system of fire defense is planned along with the development of plant brigades which will become self-contained and self-sufficient in due course.

By Leonard F. Maar
Safety Research Institute



PLANT FIRE PROTECTION Geared with Civilian Defense

CIVILIAN defense is being planned by the new Office for Civilian Defense, a division of the Office for Emergency Management in Washington. Rightly enough, the first bulletin it has released, by way of its Division of State and Local Cooperation, contains the outline of a plan for tightening all defenses against fire. This is to be accomplished under the leadership of state Fire Coordinators and local Defense Fire Chiefs, as members of state and local defense councils. It will be their jobs to survey all the existing fire-fighting resources. From this base they will organize public and private fire departments and possible auxiliaries into a vast cooperative system of fire defense, and at the same time will encourage the development of plant brigades to a point where they will be self-contained and self-sufficient.

In the chemical industries civil defense is not a simple subject. It admits of only a generalized discussion here, for between one plant and another the character of the hazards involved are extremely various. Responsible executives in each plant must lay their plans according to the needs of their own risk, and coordinate them with the over-all plans of the state and local defense councils.

On the subject of fire defense, one of the many handbooks on Air Raid Precautions published by the British Home Ministry has this to say: "Emergency measures for reducing the fire risk are mainly a matter of intensifying the precautions which ought to be in force at all times."

This, roughly, will be the broad base of industrial fire defense in this country. It will call for the training of more workers in fire safety techniques, and for the provision of additional protective equipment —a problem which the Priorities Board seems not to have reached yet. The Office for Civilian Defense has not released any statement yet regarding the methods to be generally employed in fire defense, though it may be expected to come along in good time.

Fire Defense Measures

Fire defense precautions recommended to British industries include:

1. *Reducing to a minimum the flammable material exposed.*
2. *Organizing regular fire prevention practices.*
3. *Providing equipment for emergencies.*
4. *Providing supplementary water supplies.*
5. *Training plant workers as firemen.*
6. *Providing special equipment for incendiary bombs.*

In many chemical plants flammable or explosive materials may constitute a very serious problem in the event of air attacks. Supplies of such materials on the premises should be kept to a minimum compatible with the needs of production and steps should be taken to protect materials stored and in process. Storage tanks should be mounded. This will not protect them from direct hits, but it will afford protection against splinters and blast, and from incendiaries. Working tanks, mixers, grinders and other equipment containing flammables should be equipped with dump valves that will drain off the contents into underground sumps. Fixed automatic extinguishing devices should be integral parts of all processes involving flammable liquids. Such hazards will be less acute if they are located on ground floors.

All ordinary practices of fire prevention are rigidly enforced in England, for, if a fire occurred while a night raid was on, it might serve as a beacon to raiders or provide them with a means of checking their positions, to say nothing of the interruptions of production that might ensue.

The provision of equipment is another vital matter. In this country most industrial plants are equipped with fire extinguishers, standpipe hose, sprinklers, fire doors, etc. The survey of the plant, conducted for the Defense Fire Chief, should reveal whether or not this is adequate for ordinary conditions. Additional equipment will be needed in an emergency, of course, and it may be necessary to increase standard equipment threefold.

Since normal water supplies may be disrupted by bombing, supplementary supplies need to be provided. If there is a river, creek or other body of water within 500 or even 1,000 feet of the property, it may be a valuable asset. Otherwise, reservoirs may be made, and canvas containers can be located near vital spots. A virtue of the fire extinguisher is obvious in this connection, for it operates independently of water supplies.

The training of plant fire-fighters assumes special importance in defense planning. The nature of the hazards to which workers are exposed in the course

of their work is the first consideration, and then training to handle incendiaries and operations to follow hits by high explosive bombs will be necessary.

British Fire Fighters

In British industries, manpower is deployed so there will be one "fire party" available for each 8,000 square feet of roof or floor space. These fire parties may consist of three or six men, depending upon the severity of the hazard at hand. The equipment recommended for fire parties includes:

	3 men	6 men
First aid fire appliances	3	6
Sand containers and long-handled shovels	2	4
Rolled blankets, horse-shoe fashion	2	6
Crow bar	1	1
Hand axe	1	1
Rip saw in leather case	1	1
1/2 round file	1	1
Hurricane lamp	1	2
Rope, 100-ft.	1	1
Corrugated iron sheets	3	6

The stirrup pump is used in England for spraying the bomb itself with water. A jet of water would cause the fire to become almost explosive, but a fine spray has the effect of hastening the burning of the metal and it wets down the material around the bomb to minimize the spread of fire. It takes two or three men and an auxiliary water supply to successfully operate the stirrup pump.

Dry sand, because it is easily available and inexpensive, is used to minimize the effect of the burning metal incendiaries. Britain also uses a box, the Redhill container, lined with sand, into which the bomb can be scooped and carried off the premises.

The long-handled shovels carried by British fire parties are for scooping up the bomb and placing it in the sand container. Crowbars and axes are for opening floors and partitions where fire might be spread by the bomb as it melts. Blankets protect the men from pieces of molten metal that are thrown as far as thirty feet distant from the bomb during combustion. The corrugated iron sheets are useful in protecting combustible or flammable materials exposed to the effects of the bomb.

Two to eight fire parties, depending upon the extent of the area to be protected or the nature of the hazards, are supported by a group party equipped with portable motorized pumps and hose, or hose from yard hydrants and standpipes. Each group party has about 500 feet of standard size hose with standard couplings, so that at least two streams can be directed at a fire from different directions. Foam making branch pipes, ladders, and other equipment are provided as needed.

American Departmental System

From the above it will be seen that fire parties are essentially first aid groups whose function is to reach the place where a fire bomb strikes as quickly as possible and to control its fire. In the departmentalized fire brigades in the United States it will be an easy matter to train and equip similar fire parties.

In this country, plants already are equipped with fire extinguishers and, in general, these installations conform to the recommendations of the fire insurance underwriters. For ordinary hazards, these standards provide one extinguishing unit for each 2,000 or 2,500 square feet of floor space inside buildings, so that in an area of 8,000 square feet—the space allotted in England to a fire party—there will be three or four extinguishing units available. In the emergency, this number would be doubled or trebled.

Extinguishers are not recommended for use on the bomb itself. New extinguishing agents are being developed in this country to put out the magnesium bombs. But the extinguishers will be used to put out fires in nearby material, the floors or walls, after the bomb itself has been controlled.

Backing up the fire parties will be the full resources of the plant brigades, and, under the departmentalized system*, each production unit in a plant would be theoretically capable of coping with an emergency. This is in line with current British practice which endeavors to make every occupational unit as self-sufficient as possible in order to reduce calls upon the community's fire defenses, leaving them available for use where most urgently needed. This point is important, even in communities safe from air raids, for, in a well planned sabotage attack, more fires may be started simultaneously than the municipal fire department can handle.

There are other considerations, of course, that enter into precautions against air raids. "Blackout" plants are being erected to foil night raiders, and in the event of invasion it would be necessary for each plant to devise means of carrying on without showing a guiding light to enemy planes.

Buildings containing steam boilers, pumps, switchboard and cable facilities can be protected against explosive bomb splinters and lighter incendiaries by reinforcing walls and roofs with sand bags, sheet metal or concrete. This may be especially important where cables, gas mains or steam lines are exposed.

In some British plants there has been an attempt to minimize danger from both incendiaries and explosive bombs by building partitions to subdivide large open areas. As few as twenty workers are enclosed in these splinter-proof areas and, when one of these areas is knocked out by a bomb, production can be resumed with less delay than if a large area is affected.

Bomb shelters have been provided in some plants where workmen can retire until the raids are over and the all-clear signal is sounded, but according to reports not many of these shelters are used, for the workers prefer to take their chances with the bombs rather than halt production.

George Ferguson, chief chemist, Pyrene Manufacturing Co., is about to apply the newly-developed G-1 fire extinguishing powder on burning magnesium which is scattered by the ordinary type of incendiary bomb.

*(For a complete description of the departmental brigade system, see "A Blaze Hasn't A Chance," by M. K. Bowker, National Safety News, January 1940.)

Shipping and Container FORUM

By R. W. Lahey

SCUTAN ASPHALT—INFUSED KRAFT PAPER BAGS, MOISTURE-PROOF CONTAINERS—STAYING OF MIXED CARLOAD SHIPMENTS—SALT CONTAINERS STANDARDIZED—NEW LOW COST CARTON STITCHING EQUIPMENT

Editor's Note

The protection of chemical products against the absorption of moisture continues to increase the importance of container designing. There are so many pitfalls in laboratory tests to determine moisture transmission into a container that it is inadvisable to depend on such tests unless proved by actual shipping and storage tests. The following short article on a popular material used in containers for moisture resistance may be of some assistance to those who have such problems to solve.

Scutan is an asphalt infused kraft paper, manufactured by the Scutan Division of the Union Bag Corporation at Hudson Falls, New York. It is used in vast quantities in most types of house building, in laying cement roads, under ice skating rinks, in the walls of refrigerated railroad cars and auto trucks as well as to provide moisture resistance for many containers.

The infusion process consists of immersing pre-heated paper into the specially blended hot asphaltic bath. The temperature of this bath is controlled by an ingenious system of electric heating elements which avoids interruptions to production or cooling of the compound. Special equipment is likewise used to insure a uniform spreading of the coating without impairing the strength of the kraft paper. The coated paper is then passed over water cooled rolls for rapid restoration to normal temperature.

The manufacturer claims that Scutan will not "bleed" at any atmospheric temperature and at the same time it will stand sub-zero temperatures without cracking. By this process the compound is coated on the surface of the paper filling and sealing its pores, thereby creating a surface that is waterproof and highly resistant to the passage of moisture vapor. There are many types of Scutan which will serve most requirements—or, if necessary, a special coated sheet can be provided to meet unusual needs. Scutan is available in either the single infused or double infused type, depending upon the requirements of the job.

In the field of packaging, we find Scutan liners in many large and small duplex and multiwall paper bags. It is used for one or two plies in cement, sugar, fertilizer insecticide and chemical multiwall paper bags holding from 50 to 100 pounds. It is also used as the inner ply in small duplex paper bags used for packing cracked ice, insecticides, fertilizer and many other products.

Staying of Mixed Carload Shipments

By William Block, Blockson Chemical Co., Joliet, Ill.

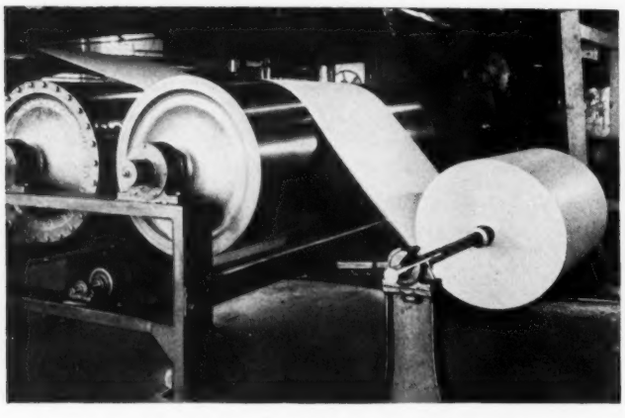
For years we have braced our carload shipments with wooden timbers and although protective in most cases, some trouble was experienced at certain points of delivery.

Like other chemical manufacturers, our products are shipped to all parts of the country, and, of course, these are exposed to the usual transit impacts, the extent of which depends upon the length of the trip and the number of switchings. It developed, over a period of time, that some of our ladings sustained a certain amount of damage due to loosening or breakage of the timber bracing.

One of our good customer friends wrote, complaining that his carloads of trisodium phosphate were arriving in a somewhat damaged condition and suggested we try the "floating load" method of bracing with steel bands. Naturally, we were concerned, and being anxious to increase the goodwill of our customer decided to look into the matter of bracing. A test car braced under the revised method confirmed the soundness of our customer's suggestion.

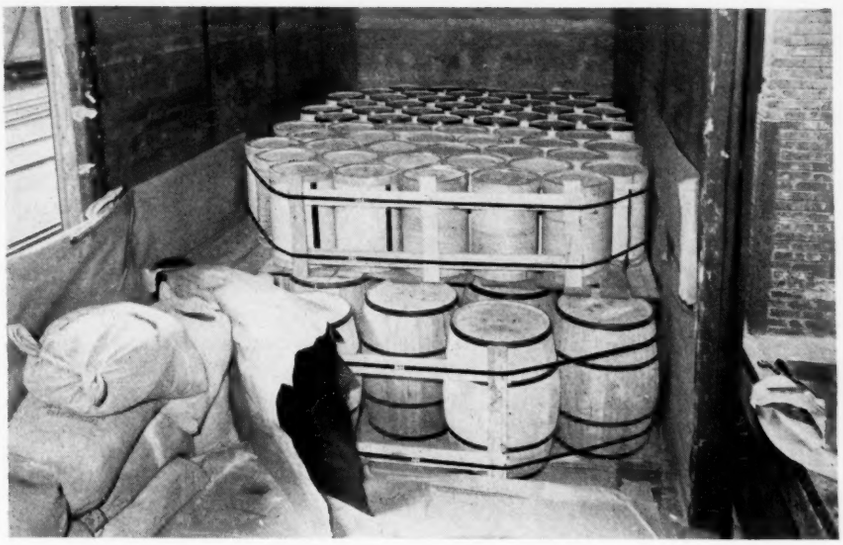
The accompanying illustration is typical of the hundreds of cars which have left our plant. Most of them are mixed, consisting of barrels, half barrels, bags and drums. And this is how they're usually prepared.

The barrels are loaded into half-car units. Two gates constructed from 1 X 4" lumber are placed at each end of the load over and around which two ¾" steel bands are placed, tensioned and sealed. A false flooring is laid on top of floor units, the half barrels and drums stowed on the second tier and strapped and the remaining half of the car filled with bags. The bags, both paper and burlap, are stowed to prevent shifting and necessary caution taken to eliminate possible tearing or snagging.



Scutan process. Steam-heated cylinders pre-heat the kraft prior to the infusion of compound.

Scutan process. Infusing compound at 460° F. is applied to the kraft in this manner.



Above, Blockson Chemical's method of staying mixed carload shipments which has reduced costs 29%.

Above, Scutan bags made with moisture-proof, durable linings.

Since we have been using this method for protecting our shipments, car-loading costs are 29% lower and complaints have disappeared completely.

Salt Containers Standardized

A revision of the Simplified Practice Recommendation on Salt Packages has just been approved by industry to become effective immediately, according to an announcement by the National Bureau of Standards, Department of Commerce.

This recommendation, which became effective May 1, 1927, established a simplified list of package sizes for the various kinds of salt. At that time there were 35 package capacities in use. The original recommendation listed only 20. The current revision, despite the addition of certain packages of recent origin, further reduces the recommended list of package capacities to 12.

The revision also includes the packaging practice of the Pacific Coast, not heretofore included, and contains a brief description of the various kinds of salt to which the packaging recommendations apply. Capacities and kinds of shipping containers are listed as well as primary containers.

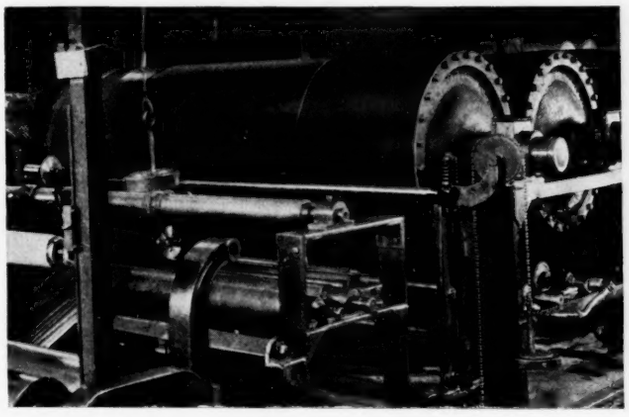
Until printed copies are available, mimeographed copies of the revision may be obtained without charge from the Division of Simplified Practice, National Bureau of Standards, Washington, D. C.

New Low Cost Carton Stitching Equipment Announced

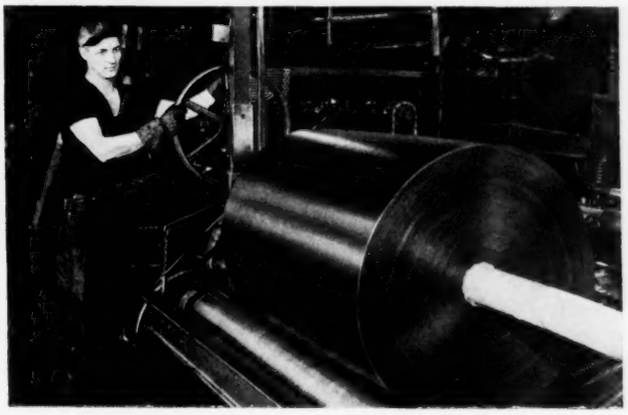
A recent announcement reveals a complete line of straight arm, bottom and combination carton stitching machines formally placed on the market by Acme Steel Company, Chicago, manufacturers of Silverstitch and Colorstitch stapling wire as well as steel strapping and other package reinforcing items.

This new equipment known as Silverstitchers is said to incorporate several features unique in the field. Included is a special single pedal control which is adjustable and reduces by 50% the manual effort required for stitching. The moving parts are few and these are reversible to cut down maintenance costs.

The straight arm type of Silverstitcher is designed for stitching sides and ends of telescope and folding cartons, beverage cases, display units, and set-up boxes, and can be easily adapted for special applications. The bottom type is made for stitching bottoms of fibre and corrugated containers, slotted cartons and collapsible boxes. The combination Silverstitcher combines both the straight arm and bottom types in one piece of equipment.



Scutan process. After infusion, the Scutan passes over artesian-water-cooled drum.



Scutan process. The roll is finished and ready for wrapping.

New Products and Processes

By James M. Crowe, *Assistant Editor*

A NEW metal deactivator designed to increase the storage stability of petroleum distillates has been developed by the Petroleum Chemicals Section of E. I. du Pont de Nemours & Company. It is recommended for both gasoline and fuel oils containing soluble metallo-organic compounds or soluble metal salts of organic acids in which it will counteract the pro-oxidant or catalytic effect of those contaminants.

"The new product, a liquid, has the same functional properties as Du Pont Lube Oil Stabilizer S, a deactivator in powdered form," a company announcement says. "Efficacy of the new deactivator in overcoming harmful effects of deleterious metals, its chemical stability pending use, and the ease with which it can be handled in the refinery, commend its use in petroleum products contaminated or subject to contamination with metals, especially copper."

The active constituent of the metal deactivator is revealed as N : N′-disalicylidene-1 : 2-diaminopropane. This molecule forms stable complex compounds with various metals, such as copper, in which the ionization, as well as the catalytic activity of the metal atoms is greatly reduced. This renders them inactive in the oxidation process of the hydrocarbons.

N : N′-disalicylidene-1 : 2-diaminopropane is a viscous liquid at ordinary atmospheric temperatures, and is therefore made suitable for general use by diluting four weight parts of it with one part of xylene.

Physical properties are characterized by the following typical analysis:

Specific Gravity, 60° /60° F.	1.076
Pounds per gallon at 60° F	8.96
Pour point	0° F.
Viscosity at 100° F	125 S.U.S.
Flash point (T.C.C.)	100° F.
Fire point (C.O.C.)	135° F.
Miscibility:	
Gasoline	In all proportions above 70° F.
	20% at 65° F.
	12% at 50° F.
	10% at 35° F.
	Greater than 1.0% at −30° F.
Fuel oil	In all proportions above 30° F.
	Greater than ¼% at −30° F.
Anhydrous benzene	In all proportions above +40° F.
Anhydrous benzene	In all proportions above —30° F.
Anhydrous acetone	In all proportions above —30° F.
Xylenols	In all proportions above —5° F.
Du Pont gasoline antioxidants	In all proportions above +35° F.

The material is stable during storage, both in physical appearance and chemical effectiveness. It has no effect on the color of gasoline or fuel oil in the concentrations usually employed. Through retarding the catalysis of oxidation of contaminated fuels, improved color stability may result, it is claimed.

Response of gasolines and fuel oils to the metal deactivator is governed largely by the nature and content of the metal catalysts present in the distillates being treated. Experience has indicated that the useful range lies between 1 and 20 parts per million, that is 0.0001 per cent and 0.002 per cent by weight, although in some instances as much as 0.005 per cent may be required.

The metal deactivator when used with gasoline antioxidants not only improves the stability of contaminated gasolines but often it has been possible to reduce significantly the concentration of antioxidants necessary to achieve the desired oxidation stability.

Use of the metal deactivator significantly reduces color and gum formation in cracked and blended fuel oils. Its addition to the oil in the still condenser or immediately following condensation, if no subsequent treatment is employed, has, in some instances, reduced the color darkening commonly encountered during the first few hours after production. In general, the sooner the agent is added, the more marked will be its effectiveness.

The metal deactivator should be fed in the required quantity to the still condenser or transfer line through suitable proportioning equipment. Should the distillate be subjected to clay, acid or caustic treatment, the material should be added immediately after those processing steps.

Textone, A New Bleach

Textone, a new product of the Mathieson Alkali Works, Inc., consists of the recently developed oxidizing and bleaching agent, sodium chlorite ($NaClO_2$), in a suitable form for the textile finishing industry.

It is claimed that the new product makes possible the production of bleached cotton goods of superior strength without the careful control of time, temperature and concentration that bleaching has heretofore required to prevent damage to the fibers.

The new process is carried out in existing equipment and without radical changes in procedure. The generally used bleaching agents sodium or calcium hypochlorite (known as chemic) are employed but to them is added sodium chlorite (Textone), which alters the chemical reactions of the hypochlorite.

When cotton is bleached by chemic, a degradation product known as oxycellulose tends to form. This is said to cause tendering of the fiber, reversion of color or yellowing on storage and uneven dyeing. By careful control of the bleaching process the amount of oxycellulose produced in bleaching cotton goods can be kept to a minimum although a little is usually formed.

When Textone is used as a bleaching agent, oxycellulose does not form. This is because $HClO_2$ and ClO_2 are given off when chlorite decomposes which products bleach without oxycellulose formation. When Textone is used with hypochlorite the bleaching that then takes place is said to be characteristic of Textone and not of hypochlorite.

Drycolene Process

Drycolene, a new atmosphere gas, developed by the General Electric Company for heat treating metals is now being used by several industrial plants in the heat treating of steel products without decarburization.

In the laboratory nitrogen is the ideal gas for operations such as scale-free hardening, bright annealing, sintering and electric furnace brazing of high carbon steels. But nitrogen is impractical in industrial operations because of the difficulty in keeping it sufficiently free from carbon dioxide, water vapor or infiltered air. Drycolene overcomes the decarburization resulting from the presence of these impurities because it contains carbon monoxide.

The Drycolene producer is a gas-fired reaction chamber having several burners of the refractory-screen type mounted through the side wall of the reaction chamber. At the top of the chamber there is a hopper for storing charcoal and feeding it down through a vertical retort.

The producer itself consumes hydrocarbon gases such as cokeoven, natural, propane, or butane gas. The gas and air first pass through flowmeters and then enter a gas-combustion controller which holds the proportions of gas and air constant. From here the mixture goes through a self closing fire check to the burners in the unit itself and burns within the chamber, heating the charcoal in the retort to incandescence. The products of combustion travel through a cooler, where most of the moisture is removed. An activated alumina dryer may be used at this point to reduce the moisture content if necessary. From here the gas travels through the incandescent charcoal where further reactions take place and the mixture designated as Drycolene is formed. Any carbon dioxide or water vapor pres-

ent is here converted into carbon monoxide and hydrogen. The gas after passing through a dropout chamber finally goes to a filter where charcoal dust is removed.

Insulating Varnish

A new formulation of Harvel 612-C insulating varnish is announced. Harvel 612-C is a phenol-formaldehyde synthetic resin-base varnish made from Cashew Nut Shell Liquid which polymerizes upon baking to an infusible-insoluble state. It is an internal drying varnish that solidifies throughout leaving no gummy half-cured interiors since it does not depend upon oxidation for its eventual solidification. The new formulation of 612-C produces a basically new varnish with improvements in speed of cure, flexibility adequate to withstand all internal stresses due to thermal expansion and contraction of windings. It resists vibration, bonding the conductors into a compact unit-acting mass. This new 612-C is said to possess unusual retention of insulating strength at high operating temperatures such as encountered with Fiberglas and other class 'B' insulated windings.

Blackening Process

The Enthone Co. has developed an immersion process for the blackening of zinc and its alloys. The process called, "Ebonol Z", consists in immersing the zinc or zinc alloy in a 1 lb. per gal. solutions of Ebonol Z salts, at a temperature from 150° to 212° F. An adherent, jet black finish is formed in from 1 to 5 minutes.

The work is cleaned in alkaline cleaners or degreased with solvents and acid dipped similarly to preparing work for plating, before being treated in the blackening solution. According to the manufacturer, 1 lb. of salts will blacken over 150 square feet of zinc surface. The bath is not critical and requires little control.

It is reported that the Ebonol Z solution can be used for producing a black coating on stainless steel, nickel silver, nickel, and noble metals, by making a couple with these metals and a piece of zinc. This can be done by using a zinc basket or by fastening a sheet of zinc to the rack or basket in which the metals are to be blackened. The process is stated to be particularly valuable for nameplate finishing where recesses are to be blackened, for blackening of etchings on rules, squares, tools, etc.

The company reports that they will be pleased to blacken sample parts for examination or tests, and are prepared to render engineering service on the blackening of zinc, stainless steel, steel, and other alloys.

New Colors

Two new vat colors have been announced. A new anthraquinone type vat color, "Leucosol" Red B Paste, produces bluish shades of red on cotton and viscose process rayon. It is very fast to 2 degree Bé. chlorine and power laundering with chlorine, the company says. The color may be used for printing drapery materials, since it is very fast to light in medium to heavy shades.

A new vat color, "Ponsol" Brilliant Violet 3B Paste, produces bright bluish shades of violet on cotton and viscose process rayon. It is recommended for printing and for dyeing by the reduced and pigment-pad methods and for use in pressure type dyeing machines. The new color possesses very good fastness to peroxide bleaching, cross-dyeing, perspiration and laundering with and without chlorine and shows good resistance to light and chlorine bleaching, the company says. It will be used to produce reddish shades of blue on drapery fabrics because of its fastness to light.

Metal Coating

The Porcelain Enamel and Manufacturing Company of Baltimore, Maryland, has developed a material, called Metlseel, which prevents corrosion and disintegration of metal parts exposed to gaseous atmospheres at furnace temperatures. With the increasing difficulty of obtaining heat-resisting alloy steels due to priority rulings, it is believed that Metlseel will be of interest to the heat-treating industry.

Metlseel, which is applied as a liquid coating, withstands heat in excess of 1500 degrees F., prevents oxidation and keeps the metal parts sound and clean.

New Resin Product

Flexalyn is a pale-colored, extremely tacky, translucent, semi-solid resin resulting from the esterification of the isomeric acids in rosin with diethylene glycol. Chemically it can be referred to as diethylene glycol diabietate, although it is actually the diethylene glycol ester of a mixture of isomers of which abietic acid is the typical constituent.

Flexalyn can be simply described, and its value readily understood, in terms of its five major properties. It is a resin with a high refractive index. It is sticky and persistently adhesive. It is neutral. It is non-hygroscopic and water-insensitive. It is compatible with most film-formers—with nitrocellulose, ethyl cellulose, polycyclo rubber, chlorinated rubber, rubber itself, latex, shellac; and is miscible with the hydrophyllic colloids such as starch, casein, gelatin, glues, methyl cellulose, gums, etc.

Flexalyn thus will prove interesting as a plasticizer, softener, or tackifier—in adhesives, plastics and protective coating compositions. Its solvency and compatibility open the door to its use as a versatile type of modifying agent—a solid, highly refractive resin whose properties approach those of a liquid plasticizer, and whose semi-solid state is relatively permanent; which exhibits specific adhesion for all types of surfaces and exerts a strong binding action on pigments and inerts.

Flexalyn is currently offered as a solid resin and, under the name Flexalyn Solution, 80% solids in xylene. Additionally, this material is available in a stable emulsion, for use where optimum application of the resin is obtained by means of a non-viscous water emulsion.

Anhydrous Sodium Molybdate

A new method developed by the Climax Molybdenum Company has made possible the production of anhydrous sodium molybdate on a commercial scale. An important use of the material is in the production of color lakes. Formerly it was necessary to use a sodium molybdate containing considerable water of hydration, or to buy roasted molybdenum concentrates and produce the sodium molybdate preparatory to use in color lake production.

The anhydrous product dissolves rapidly with some evolution of heat which is desirable in certain processes. It is sold as the chemically pure grade, maximum impurities being 0.10 per cent although the product usually contains not more than 0.05 per cent impurities.

Automobile Refinisher

A new automotive refinishing material, "Dulux" Make-Ready Undercoat, designed to improve adhesion when synthetic resin enamels are applied over old finishes, has been announced by the Finishes Division of E. I. du Pont de Nemours & Company. "Make-Ready" represents, it was said, the latest development in materials of this type, and reduces the time required for refinishing.

The desirability of replacing 63-008 Red Oxide Metal Primer with a quick-drying, more speedily-applied material prompted the development. The Company prescribes the following routine for use:

All wax, polish, and grease must be removed from the surface with "Prep-Sol" before application. Where the finish is broken it should be sanded bright and feathered at the edges. Broken or badly weathered areas should be spot sprayed with High Speed Pyroxylin Primer-Surfacer and allowed to dry for thirty minutes.

"Make-Ready" requires reducing with an equal volume of "Duco" pyroxylin lacquer or "Pyralux" Thinner. The smoothest surface may be obtained by spraying at 40 to 50 pounds pressure. The undercoat should be allowed to dry for one-half hour and "Dulux" enamel sprayed on immediately.

(*Continued on page 751*)

ADVERTISING PAGES REMOVED

New Centrifuge QC 119

Centricone is the name of a new centrifuge, developed by the Precision Scientific Company for laboratory application. It embodies the principle of retaining the tubes at a fixed angle. This is said to accelerate sedimentation to a great extent and to produce clear solutions or liquids without tedious filtrations.

Because of the fixed angle of the tubes with no swinging of tubes in a vertical plane, particles need not pass through the entire depth of liquid, but only to the side of the tube. From the side of the tube, movement to the bottom is extremely rapid.

The oversize brushless induction motor, equipped with grease packed ball bearings, is fully enclosed to shut out dust and fumes. No lubrication is necessary. Motor has a high starting torque, reaching maximum speed in 10 seconds.

Two models are offered—the Clinical Model will take four 15 ml. centrifuge tubes; the Micro-Semi-Model has a capacity of six tubes. Holders may be had in a choice of four different types to accommodate a total of nine different sizes of tubes, from 1/2 ml. capacity to 1/2 x 4″ tubes for micro or semi-micro work. Tube holders are removable and interchangeable. In the event of glass breakage, tube holders can be slipped out and easily cleaned, then replaced. The head need not be changed for different sizes of micro or semi-micro tubes.

Hydraulic Press QC 120

The 20″ x 20″ hydraulic press here illustrated is one of twelve recently built by Farrel Birmingham Co., Inc., for molding of small rubber and plastics articles. This press exemplifies the principle of modern streamlined designing, which not only provides improved appearance, but facilitates keeping the press clean and the floor area orderly.

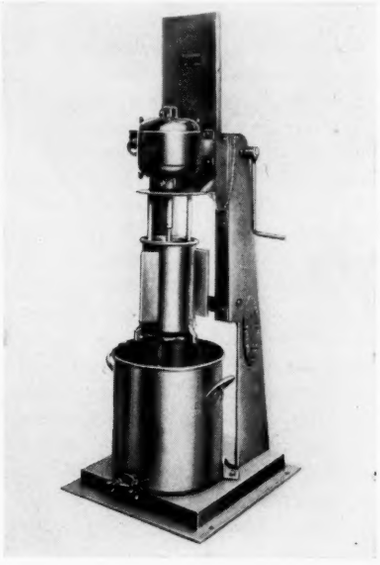
The housing, which includes the top, bottom and sides, is a single casting. Set in the base of the housing is a cylinder made of Meehanite. The cylinder and gland are lined with bronze and the gland studs and nuts are stainless steel. These features prevent corrosion and add to the ease and economy of maintenance and increase the life of the press. The press is designed to operate at an initial water pressure of 2000 lbs. per square inch, giving a total pressure of 113 tons or 563 lbs. per square inch on the platens.

Change-Can Mixer QC 121

The unit illustrated here is a recent development by the Abbe Engineering Co. for mixing and dispersing of a wide variety of products in removable containers or cans with capacities from 5 to 50 or more gallons.

The application of a patented dispersing arrangement with the ribbed mixing disc rotating at the bottom of the container and the stationary baffle cylinder above it, results in a combined disintegrating and dispersing action which produces a homogeneous mixture.

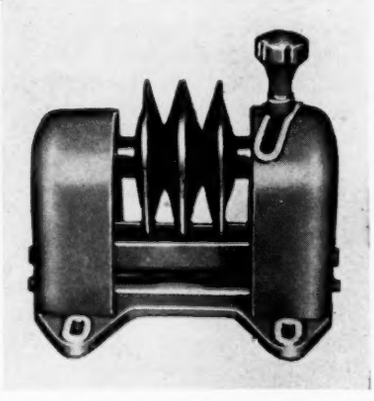
By turning the handle the mixing element is readily raised from the container



and the latter is easily removed and a new container put in its place. Cleaning of the mixing element is accomplished by rotating it in a container of water or other solvent. Where the nature of the material requires it, stainless steel, Monel metal or other alloys best suited for the purpose may be had.

Variable Transmission QC 122

A new V belt variable speed transmission, known as the ALL-SPEED, is now



being introduced to industry. The speed selector operates on the variable pulley principle, and consists of two interlocking pulleys mounted on a common shaft. The variable speed spindle can be pivoted laterally between the motor and the driven machine to provide new running diameters on the interlocking pulleys. The selected speed is maintained by means of a lock nut on the control quadrant, and the oblique slot which automatically guides the spindle at all times insures belt alignment and increases belt life.

Chemical Industries
522 Fifth Ave., N. Y. City.

I would like to receive more detailed information on the following equipment: (Kindly check those desired.)

QC 119	QC 121
QC 120	QC 122

Name .....

Title ..... **Company** .....

Address .....

NEW CHEMICALS FOR INDUSTRY

Ready formability of Vinylite plastic sheet is responsible for this new adaptation of the material—"rippled" vases and dishes. Tinted in various colors, beautiful designs are effected for decorative purposes as shown here. Vinylite plastic sheet's strength, resistance to breakage and moisture resistance are used.

Digest of Chemical Developments in Converting and Processing Fields

CHEMICAL INDUSTRIES

Above, irradiation of protein film. (Photo, Ditto, Inc.)

Recent Developments in PROTEIN CHEMISTRY

By Dr. Johan Bjorksten
Chief Chemist, Ditto, Inc.

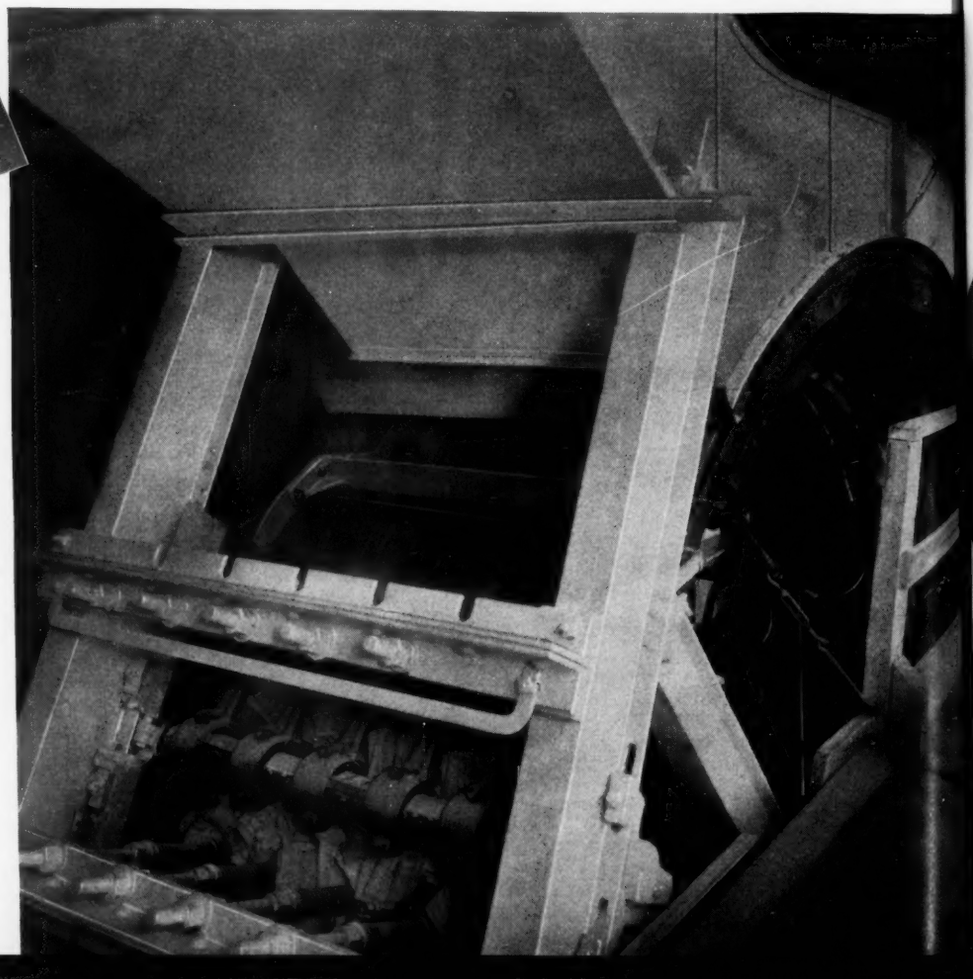
The ready availability of proteins in unlimited quantities at low cost has stimulated research in protein chemistry and has broadened the scope of its utility. Our author, also a patent attorney, gives us the latest developments.

IN the current search for materials capable of taking the place or function of other substances, a review of recent developments in commercial protein chemistry appears in order.

The word "protein" is derived from Proteus, a deity in Greek mythology, who excelled in changing his shape at will, whimsically, or as opportunity demanded. The name has been aptly transferred. No material approaches the proteins in adaptability to the most diverse applications ranging from highway construction and duplication films to insulin and barrel linings.

The ready availability of proteins in unlimited quantities at low cost from stock yards and farm fields has stimulated

Steam heated drying wheel, below, for rapid drying of protein solutions.
(Photo U-Cop-Co, Wilson & Co.)



research, which in spite of the great complexity of the material, is steadily broadening the scope of its utility.

Representative, technically-important proteins are soya bean proteins, zein and zeanin from corn, casein, gelatin and blood proteins.

Proteins Resemble Synthetic Resins

In a broad sense the proteins resemble synthetic resins of the type of cellulose esters or ethers, or polyacrylates, in that they contain in their structure extremely long chains of interconnected atoms. By the action of tanning agents these chains can be tied together to a rigid frame, or net-work, and if this action is carried far enough they will assume a physical similarity and chemical analogy with heat-hardened resins of the phenol-formaldehyde type. The proteins, however, are unique in having a great number of chemically highly-reactive groups in their structure which impart a capacity to react with many substances and equip them with adaptabilities far exceeding those of any other type of material.

The application of proteins may be divided into three principal groups:

A. Those in which the protein is partially broken down to yield products of reduced viscosity and increased solubility. (Products obtained by complete *destruction of proteins are beyond the scope of this article, although many of them are highly important in nutrition, as meat flavors, as corrosion inhibitors and in medicine.)*

B. Those in which there is no change in the size of the protein molecule. These are usually compounding processes in which the protein is not changed chemically, but may also involve an uncoiling or straightening out of protein chains, known as "denaturation."

C. Those in which protein groups are joined together to larger aggregates, usually of increased viscosity and reduced solubility.

Degradation Processes

When the protein, as obtained from its natural source, is too viscous or too insoluble, mild degradation processes are employed. The most important case is perhaps soya bean protein, which for paper coating purposes may be too viscous, particularly when it is to be substituted for casein. The protein-splitting enzymes of yeast have been used to effect such a change in these proteins (Takamine and Satow, 1917)[87] (Cummings, 1941),[84] and in April, 1941, a process using as an essential step a mild treatment with mineral acid was patented by Julian and Engstrom.[85]

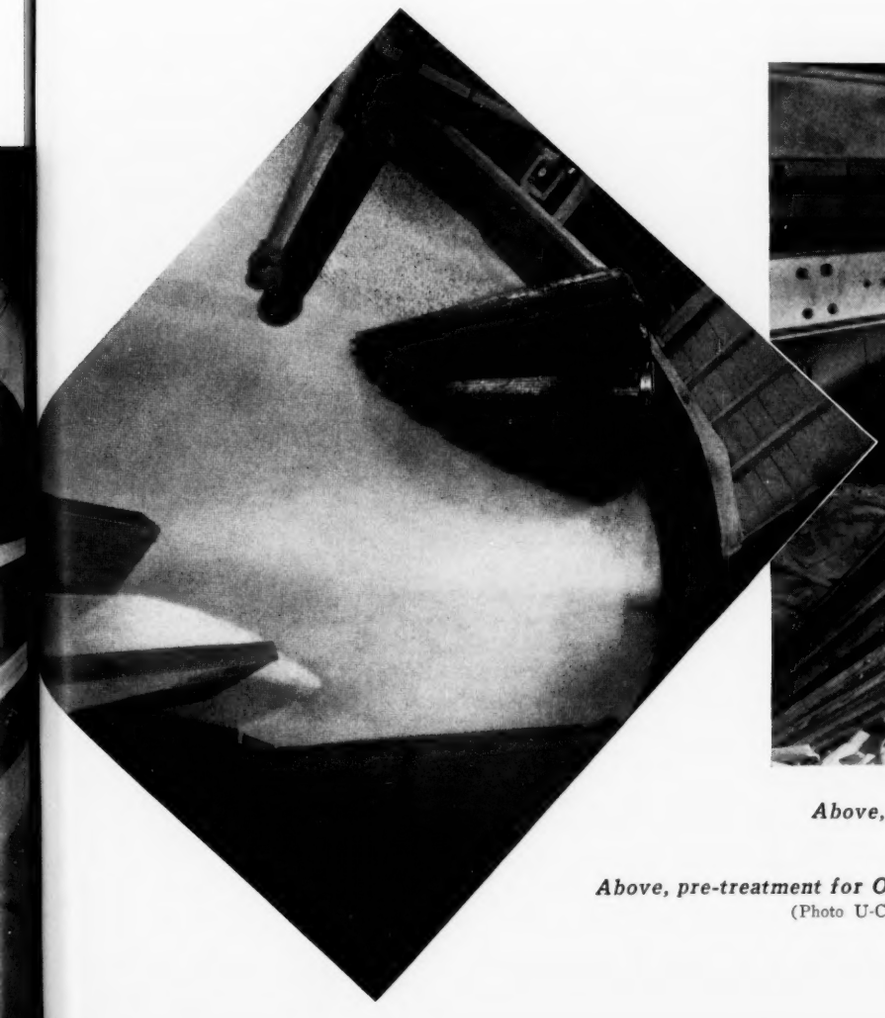
Very insoluble waste proteins, such as hoofs, hair, feathers, fish scales, etc., have been rendered digestible by an analogous treatment. The U. S. patent on this development[88] is issued to a German inventor, and may be indicative of German efforts to utilize completely all animal protein.

Breakdown of Proteins

In these instances, a controlled mild breakdown in the protein has been used for desirable ends, but more frequently such breakdown is an obstacle to be overcome. For example, it is a principal difficulty in the manufacture of textiles from proteins. In these processes, a protein solution is extruded through small openings into a bath of a hardening agent, usually though probably not most advantageously, an aldehyde. The *longer* the chains of connected atoms in the initial molecules of protein, the better will be the product.

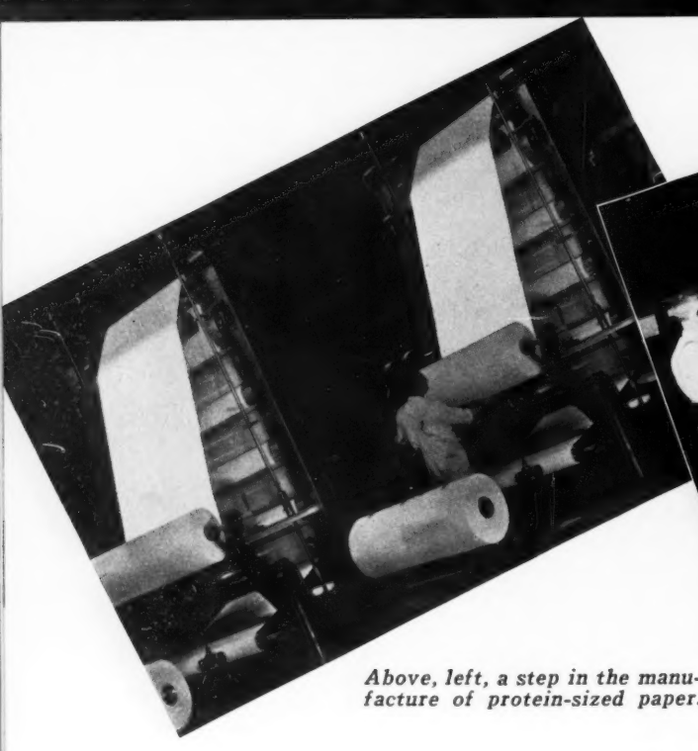
Here *longer*, and not *larger*, is written deliberately. The distinction is important. The mere size of the molecules, or the molecular weight has been over-emphasized as a criterion in a manner which may have delayed progress in protein chemistry.

For example, a protein which has in



Above, pre-treatment of pig skin for gelatin extraction.
(Photo U-Cop-Co, Wilson & Co.)

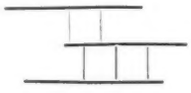
Above, pre-treatment for Ossein extraction.
(Photo U-Cop-Co, Wilson & Co.)



Above, left, a step in the manufacture of protein-sized paper.

Above, left, hectograph films coming off conveyor. Photo, Ditto, Inc. Above, right, Manufacture of gelatin.
(Photo U-Cop-Co, Wilson & Co.)

its structure short chains connected by bridges:



has properties entirely different from those of a protein:

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although both may have the same molecular weights, the same percentage composition, and may yield the same decomposition products, under the influence of strong acids or alkalies.

This distinction is industrially important. It has not been sufficiently considered by academic workers.

An important step to reduce undesirable partial breakdown of proteins in the source of purification or dissolution processes, is covered by a recent patent[130] to Oberg of the U. S. Gypsum Co. According to his procedure, the crude casein solution is atomized, and the finely divided spray is subjected to a gaseous precipitating agent, such as hydrochloric acid, sulfur dioxide, etc. The resulting precipitate, formed in the atomized state, is inherently very fine and can be quickly washed and dried with a minimum of breakdown. A related process, applied to zein, was patented in April, 1941, by Horesi, Flint and Swallen.[110,111] While these processes have been developed by organizations remote from the textile field, they may have a profound bearing on improvements in protein textiles. These, it is understood, are still not of sufficiently high quality to satisfy consumer requirements in countries where wool and cotton are cheaply available, excepting as admixtures in specialized products, such as hat felt.

Among reactions involving decrease in molecular size, de-amination is also important. It is effected by treatment with nitrous acid, which converts the amino groups to hydroxy groups. Such a conversion, though not complete, does appreciably alter the surface characteristics of the protein. For example, de-aminized gelatin is stated in a recent broad patent to Grettie,[33] to have quite superior whipping qualities, of value in the manufacture of marshmallows and similar food products.

Recent patents for manufacturing proteins, are largely confined to operative details without general interest. Zein, the prolamin from corn, has been gaining industrial prominence largely because of its solubility in aqueous alcohol, nitroalcohols[157] and the like, and because of abundant availability. In several types of coatings it is replacing nitrocelluloses and its principal present uses are in specialty coatings. The basic method of manufacture was patented in 1891 by Osborn,[112] but patents on various applications and details of preparation have recently issued to Coleman, the Zein Co.[48, 64, 153] Several other patents have been assigned to the Prolamin Products Co. and the Corn Products Refining Co.[3, 29b, 36b, 40, 60, 86, 95, 102, 103, 106, 107, 110, 111, 133] Recently a patent issued covering printing inks containing zein,[137] and this development seems to be proving commercially important.

Soya proteins also show great activity in patent development. The patent to Julian and Engstrom, already mentioned, shows how the high viscosity characteristics can be controlled, which is important, particularly in coatings. Another 1941 patent to Brother,[149] covers improvements in thermoplastic soya resins. A patent to Brother and A. K. Smith[150] contemplates soya protein solutions of high stability. Broadly speaking, however, little of fundamental character has been patented in the last two years, and progress has been largely centered on consolidation and extension of the gains these soya bean proteins are making in the fields of paints, paper coatings, plastics, emulsifiers and adhesives.

Requirements and conditions analogous with those just touched upon in conjunction with protein textiles apply to protein adhesives, paints, binders, and coatings. Here, too, it is desirable to avoid uncontrolled hydrolysis, and to have solutions or suspensions of high stability.

Many of the recent patents in these fields contemplate methods for removing calcium from milk solids or caseinates, by the use of agents giving calcium salts less soluble than tri calcium phosphate, for example, with oxalic, hydrofluoric or metaphosphoric acids,[152] fluorides and boric acid,[155] or by treatment with an active base exchanger of the permutite type.[161]

Several special applications of potential importance have been patented in 1940 or 1941. For example, by compounding animal glue with rubber, sandblasting stencils of very high impact resistance have been made.[131] A glycerin-glue composition has been patented as a de-icing coating for airplanes.[128] This invention is unique in that it takes advantage of syneresis or "sweating-out" of plasticizer, a condition which the coatings industry generally takes great pains to avoid. A milk composition has been patented for sealing cracks in walls,[140] another compound for joining concrete slabs in highway construction.[29] Barrel linings,[129, 138, 139] fire extinguishing compounds,[134] paper coatings, rust preventive coatings,[132] boiler compounds,[136] sausage meat[71] and composition boards are other instances where recent patents illustrate the amazing

applicability of proteins. By an ingeniously simple method gelatin has been produced in hollow drops,[130] and another patent covers such drops, or other gelatin products flavored on the inside, but not on the outside where the essential oils might be oxidized.[74] A gelatin aerogel has been patented for use in dentifrices.[170]

In the medicinal field, much progress has undoubtedly been made in the isolation and purification of biologically active proteins, for example, hypophysis hormones and kidney pressor substances. However, recent patents reveal but little. The steps in the processes in purification of proteohormones are old; adsorptions, elutions, extractions, precipitations, and the improvements rest in selection of specific agents or conditions of operation. Such steps are not broadly patentable; equivalence of steps or agents is indefinite and hard to prove. The firms pioneering in this field, therefore, prefer to keep their processes secret rather than to apply for patents which would be easy to circumvent. It is illuminating that almost all of the patents issued in this field last year have been either to researchers in other countries, or to the Research Foundation. Exceptions are the Sahyun patents for crystallizing insulin and insulin preparations.[113, 116, 121, 122, 127]

Among reactions not entailing any change in molecular size, is the insolubilizing of proteins by heat treatments. A majority of the processes for manufacture of protein plastics involves heating steps bound to result in the uncoiling of the protein molecule, which is known as "denaturation," but with only two exceptions, this is combined with treatment with tanning agents, so that the process leads to a product of increased molecular weight and high rigidity.

Of those protein reactions which involve an increase in molecular weight several merely add new groups to the protein chains without causing association between different protein molecules. Here belong reactions on protein with esterifying or etherifying agents, such as alkyl halides, alkyl sulfates, glycol halohydrins, etc.[30] The resultant products have been used for a multitude of purposes; among which molding, varnishes and lacquers are most notable. Alkylization of the amino groups renders proteins indigestible to moths and other insect pests.[37] Condensation with ethylene oxide, cetyl alcohol and butyric aldehyde has given waxy materials suitable for textile and leather treatment.[35] Condensation of casein with ethylene amine and phenyl isocyanate has given protein compositions of entirely new solubility characteristics[39]; they are insoluble in dilute acids and alkalies, but soluble in aniline, pyridin and polyglycols. Reaction products between albuminoids and sulfonated oils[31] have been used for fabric cleaning and for binding dye to fabric. The fluosilicate of piperidyl methyl zein is a good mothproofing agent.[34] Possibly belonging in this class is a patent recently issued to the German Dye Trust on a method for preventing the coagulation of blood, by addition of about .1 per cent of a water soluble amino acid having more than one organic radical with carboxyl group for each basic nitrogen atom.[36]

Two recent patents[32, 38] contemplate a condensation between a protein, an aldehyde and an amino substance. While that is not stated in the patents, it appears that the principal reaction is a joining of the amino with the protein over the aldehyde group, in analogy with one of the key reactions in aldehyde tanning.

Tanning Most Important Protein Reaction

Of all the reactions of proteins, tanning is by far the most important.

All protein plastics result from tanning processes. In adhesives, joining materials, yarn strengthening agents, and leather manufacture, tanning processes are of essence. In photographic or hectograph duplication films tanning processes impart to the gelatinous base the necessary resistance to temperature and humidity.

These applications, in which protein molecules are joined by the tanning agents to framework of desired rigidity and resistance, are among the commercially most important. Protein plastics are becoming increasingly significant as difficult control problems are being mastered, and as the defense drive compels substitutions of plastics for metal on an ever increasing scale.

Composition boards in which protein adhesives, suitably hardened by tanning, give the necessary cohesion, are being used in rapid construction work. Gaskets of high resistance are made by saturating a porous material with protein and subsequent rapid immersion in a hardening bath, and analogous processes greatly increase the tensile strength, and consequently the wearing qualities of short-fibered materials such as woolen yarns.

The importance of photographic films in defense is obvious, and wide application of hectograph duplication machines using protein films of carefully controlled characteristics, has eliminated enormous amounts of re-typing with consequent loss of time and possibilities of error, in aircraft, ship building, chemical, and numerous other key-industries.

All tanning reactions depend on the formation of bridges between chains of protein molecules. These bridges obviously unite the protein molecules to a larger block so as to multiply the molecular weight, and to make the entire system more rigid.

If we consider the number and the variety of reactive groups in the protein chains, we readily appreciate the innumerable possibilities for bridge formation. Indeed, any organic or inorganic substance capable of reacting simultaneusly with any two of the free groups in the protein molecule, is a tanning agent. Some of these agents act instantaneously; others, as for example oxygen, the simplest tanning agent, only very slowly, over a period of years. Some of the tanning agents form very stable bridges; for example, chromium and zirconyl salts, while others form bridges based on chemical reactions readily reversed or modified by changes in acidity or by other ingredients present.

Typical of these latter instances are many aldehydic tanning agents, which form bridges in which amino or imino groups of the protein are connected by a bridge based on the familiar Schiff reaction.

Where the protein contains relatively few reactive groups (e.g. zein), selection of a tanning agent for production of plastics or textiles becomes particularly critical; and best results should be obtainable with organic tanners other than aldehydes.

Particularly in the photographic and duplication industries, a major problem is to carry tanning to a certain point, where the most suitable state of association is reached, and to arrest it there. Excessive tanning would lead to cracking of the film, or to bleeding out of the plasticizer, and even very slightly excessive association between the chains of protein molecules may critically interfere with the function of the product. On the other hand, even slightly too low tanning, or any reversion of the tanning, may lead to the destruction of the product by summer heat or humidity.

A recent patent held by Eastman Kodak contemplates tanning with formaldehyde, and subsequent removal of

excess formaldehyde by washing. Procedures similar in principle are used for producing hydrocarbon resistant coatings for barrels or drums.

Once a protein has been reacted with even less than .01 per cent of a low molecular aldehyde, a continuous reaction will take place. The aldehyde molecule appears to act much like the slider on a zipper, moving along the chain-like molecules and locking them together sidewise. If the mobility of the aldehyde molecule is impeded, obviously this progressive tanning is reduced. This may be accomplished by selecting an aldehyde having a structure sterically preventing such motion, or containing other groups adapted to fix the aldehyde in a constant relation to the protein molecule. For example, a patent to the German Dye Trust[183] covers aldehydic tanning agents containing a carboxyl group. Though this is not stated in the patent, it appears plausible that the carboxyl may provide a point of attachment to the protein molecule based on a different reaction, and thus prevent, or at least impede motion of the aldehyde within the protein system, and consequent progressive tanning.

To those working on this type of precisely regulated tanning, a strange resemblance is apparent between the "aging" or progressive tanning of photographic or of hectograph duplication films, and the aging of the human body. Both processes involve protein reactions, leading to reduced hydration, loss of elasticity; all the earmarks of slowly, but inexorably, progressing tanning reactions.

And the chemist, observing this strange analogy, must wonder if the aging of the human body might not largely, and even principally be an instance of a progressive tanning reaction akin to, or identical with, the "after-hardening" of proteins tanned with a slight trace of aldehyde, in contact with oxygen. The photographic and duplication industries know means of delaying these reactions which are fairly effective, and it does not appear altogether impossible that, at some future time, important contributions towards prolonging the span of human life may emanate from this industrial work.

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New Products and Processes

(*Continued from page 743*)

Modified Phenolic Resin

FCD No. 140 a new resin has recently been added to a regular line of ester gums, phenolics, modified alkyds and processed natural resins. This new product is a high-melting, extra hard, high viscosity, modified phenolic resin. Besides being satisfactory in the usual varnish oils, the company states that it will be found to impart rapid dry, good hardness, and increased viscosity to varnishes based largely on oils or the perilla and linseed type. FCD No. 140 melts at 148-153° C., has a color of WG-N and an acid value of 12-18. The solution of 50 parts resin with 50 parts toluol will have a viscosity of D-E.

Nickel Process

The employment of nickel carbonyl in the production of nickel metal from nickel-copper matte in the well-known Mond nickel process is a technique of some years' standing. A process for producing nickel from the carbonyl, differing in some respects from the Mond method, is protected in German Patent 618,108 in the names of the I. G. Farbenindustrie A. G., L. Schlecht and M. Naumann.

The many-sided uses of nickel metal in the metallurgical industry are sufficiently known, but the use of nickel carbonyl as a substitute for nickel metal appears to be novel and some particulars of the method of its employment may be of interest.

In the first place, the use of nickel in the form of its carbonyl caused difficulty, principally because of the material being in powder form, but these early difficulties have been overcome. For obtaining pure nickel from the carbonyl, it is usual to employ either a coke-fired crucible furnace or a coreless induction furnace of about 600 kg. capacity. In the latter type of furnace, it is recommended to add a certain amount of nickel scrap to the carbonyl powder and to melt this mixture under a good covering of sand or powdered glass, and then to introduce further quantities of the carbonyl under the liquid slag until the full charge is reached. The molten charge is then deoxidized and desulfurized by manganese and magnesium additions in quantities of about 50 gm. each to each 100 kg. of nickel.

The principal function of the manganese is deoxidation, and of the magnesium desulfurizing, the nickel. Naturally, the nickel carbonyl decomposes in the furnace to form nickel metal and carbon monoxide gas, and while the latter escapes from the metal bath, it is said that this escape is not so rapid as to be violent. When the nickel produced is required to take a high polish, it is important that the sulfur content be very low, and the nickel obtained from the nickel carbonyl powder lower in sulfur content than the usual trade nickels.

The authors state that in all cases in which nickel carbonyl has been used to replace nickel metal, the products in no sense have been inferior to those made by the use of nickel metal. Moreover, the average higher purity, and particularly the very low sulfur and freedom from hydrogen, are advantages compared with trade nickel metal. *The Chemical Age*, Feb. 3, 1940.

Nyprene Resin

Here is a versatile new terpene polymer resin developed from turpentine raw materials. It has a melting point of 140-150° C., pale color, low ash, and is neutral and non-saponifiable. It is said to have good resistance to water, acids and alkalies. Nyprene differs from rosin in that it has a strictly hydrocarbon structure. Some of the most interesting properties of Nyprene resin are its compatibility with paraffin, natural and mineral waxes, and its exceptional softening action on rubber. It is compatible with Vistanex polybutylene. Nyprene should be useful for alcohol resistant coatings in conjunction with Pliolite. Blended with rubber the resin behaves as a pressure sensitive adhesive.

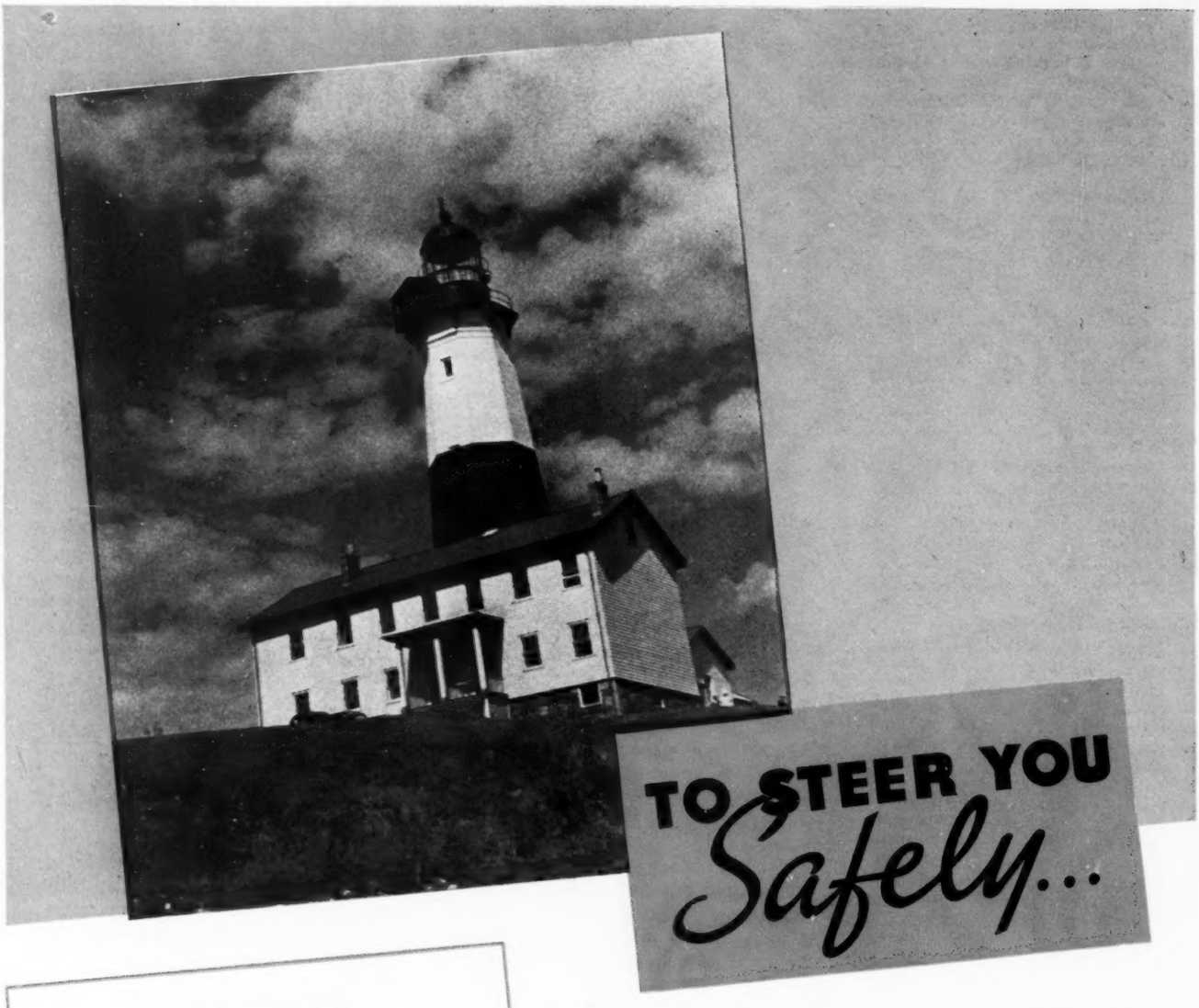
New Marine Products

Development of four new marine products, a marine spar varnish and three new "Dulux" marine colors has recently been announced.

The Marine Spar Varnish is intended for use on new wood or on previously varnished wood where it is not possible or necessary to remove the old finish completely. It is described as an excellent medium to secure a satisfactory build with few coats. It also eliminates the necessity of a wood primer. In many cases, one coat is sufficient to complete the job. It dries dust free in approximately thirty minutes, tack free in four to five hours, and is ready for another coat in six to eight hours.

The three new colors of Ship and Deck Finish are designated as Biloxi Blue, Hatteras Gray, and Belfast Green.

It is said that these finishes dry quickly, permitting the boat to be put back into service in a comparatively short time. The makers claim that experience indicates that these finishes are resistant to oil and gasoline, are superior in durability, and retain their color and good appearance over an extended period.



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U. S. Plywood Corp. is now distributing this one-part cold-setting plastic adhesive manufactured by Plaskon Co., Inc. Known as Weldwood Water Proof Glue, this new plastic resin is particularly applicable for use in airplane construction.

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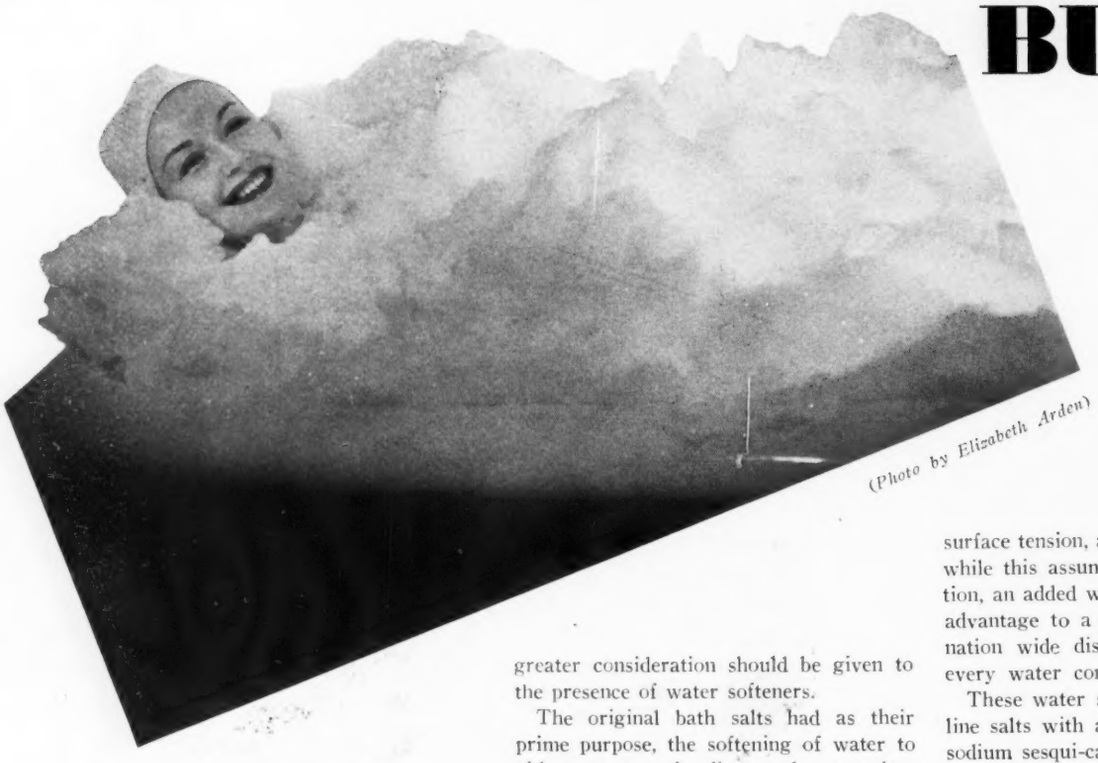


(Photo by Elizabeth Arden)

By Lawrence D. Gibson
Chief Chemist
Cunningham Cleanser Corp.

The increasing popularity of the bubble bath is reflected in every drug store window in the country and in almost every bathtub. Here's a story on the formulation of bubble bath preparations and a good review of their characteristics. Three formulas in as many price classes are included for your information.

FAD or fancy, those that use the so-called Bubble Baths do get some enjoyment from their use. The very fact that the consuming public has given them any consideration indicates that bubble baths have some foundation for usefulness. It adds enhancement and zest to a habit that is liable to become monotonous and fills a void that is lacking in our daily bathing and personal washing habits.

With abundant foam and pleasant aroma, essential as they are, a bubble bath salt is primarily from a chemical point of view a water softener. They are in reality a progressive development of the bath salt. Many may not believe this. It, nevertheless, is true. Such being the case, greater consideration should be given to the presence of water softeners.

The original bath salts had as their prime purpose, the softening of water to either remove the lime and magnesium salts completely or render them inactive of combination with the soaps that we bathe with, thus preventing these insoluble salts forming scum and bathtub ring. The addition of the foaming agent adds not only the characteristic of abundant foam, but also adds a wetting agent which imparts a certain softening effect to the water, in that it has a high power of breaking down the surface tension. These foaming agents are what are known commercially as wetting agents. They are sulfonated products of fatty acids, higher fatty alcohols, petroleum products, usually the sodium salt. To produce them in the form suitable for dry powders a considerable amount of Glauber Salt or sodium sulfate is added. Physical form may be as a flake, powder or granule. This presence of Glauber Salt does not detract from their wetting power up to a certain point.

The percentage of Glauber Salt in these commercial products ranges upward to 60 to 65 per cent., running from 35 per cent. up close to 100 per cent. organic. The closer to 100 per cent. organic the more difficult they are to handle in perfuming, coloring and blending as a finished product.

In selecting such a foaming agent as a base, two prime characteristics should be noted. First, the abundance of foam and secondly, the quality of closely tightly knitted bubble. This latter is usually stronger and hence, long lasting.

Proceeding from this point the next consideration is the water softeners. Some products, already marketed, use no water softener, relying on the assumption that the foaming agent, while lowering the surface tension, acts as a softener in itself. while this assumption has some justification, an added water softener is a definite advantage to a product that is aimed at nation wide distribution and must meet every water condition.

These water softeners are mildly alkaline salts with a pH value of 10 or less, sodium sesqui-carbonate, borax, being the ones commonly used. However, the latest developments of the higher phosphates have made themselves felt and offer a much better water softening action. Aside from this softening action there is a better detergent value, and essentially so when there is a further use of soap in bathing. By the use of these newer water softeners there is a better chance that the foam will not recede completely when a bath soap is used for cleansing. The use, therefore, of water softeners is essential to a good Bubble Bath.

The use of certain acids in conjunction with bicarbonate or carbonate, for the purpose of producing an evolution of carbon dioxide greatly speeds and aids the building and longevity of the foam when used in combination with a foaming agent. It helps to lift and diffuse the perfume more abundantly. This principle seems to dispel a certain amount of the hygroscopic characteristics so often encountered with foaming agents. This hygroscopic character can also be reduced when certain water softeners are used in correct quantities. Their affinity for moisture prevents the foaming agents from caking and keeps a free flowing product at all times.

Perfuming is accomplished by the use of essential oils, either compounded from bases or already blended by competent perfume specialties. Percentages usually range from one quarter per cent. to one per cent. These are further enhanced by the judicious use of certain essentials that are known as lifters imparting a fuller abundance to the odor. The higher the organic foaming agent present the more difficult becomes the pefuming operation. Normally the perfume is blended

BATH SALTS

with the water softeners and then folded and blended with the foaming agent. In the case of the higher percentage organic it is necessary to resort to spraying. In this case the oils should be added to a proportion of alcohol. Better dispersion and less tackiness to the finished product will result.

Whenever colors are resorted to, a great amount of care should be exercised in blending. Only certified colors should be used and close control exercised so that a definite uniformity will result. The use of alcohol is preferable, as the colors are better dispersed and the color more easily deposited. The use of colors is particularly adapted to the transparent container, adding greater attractiveness and hence less sales resistance.

In completion of a final formula there are certain fillers that may be made a component part of the structure. These are usually neutral salts. They neither add nor detract from the active ingredients. Ordinary sodium chloride purchased commercially in many physical forms—Glauber Salt, starch, various types of clays, colloidal or otherwise are considered in the category of fillers. However, in making use of these types of components, make judicious selection, whether it be a price consideration, matter of bulk to weight in order to fill a size package or physical appearance of product. In this latter case the selection should be governed so that the same size particles are kept as closely together as possible, never attempting to mix a powder or granule with a flake. Separation will surely result producing a non-uniform product when it reaches the consumer. Both the package and the product should be built together. The product can be made bulky or heavy as individual tastes may dictate. It is possible to place within a volume that takes 16 ounces of one product, 6 to 7 ounces of another product. And it is safe to say that in keeping the volume constant as the weight decreases the same quantity of foam is the result. This observation is made provided there is not too high a percentage of inert salts or fillers present.

In the selection of the package for bubble bath salts it should be remembered that the product has a tendency to cake and become tacky to a greater or lesser degree when exposed to the air. From June until October this tendency is heightened. Also the higher the organic foaming agent present the greater the difficulty particularly during this time of year. Therefore, a package whether it be envelope, cardboard, metal or glass should be selected that has the properties which will exclude air moisture. The package need not be absolutely air tight in the strict sense of the word, but reasonably so.

A pertinent thought in packaging might be considered in passing. A container should be selected that will serve some useful purpose after the bubble bath has been used.

In conclusion, the quality of the bubble bath should be kept on a high plane. It should have the foaming properties that essentially are its birthright. For it is only logical that public opinion and consumer consideration will be given to a product that measures up to a high quality standard. If this is kept in mind the bubble bath will enjoy a long and prosperous life, giving to those that produce and distribute the item a stable source of income and to those that consume it enjoyment and pleasure that will act as a tonic in this topsy-turvy world of today.

Three Formulas:
Three Price Classes

Lower Price

25% Foaming Agent
25% Sodium Chloride
50% Sodium Sesquicarbonate
4 to 6 oz. Perfume per 100 lbs.
Color to any desired shade, dispersed with Ethyl Alcohol

Medium Price

35% Foaming Agent
65% Sodium Sesquicarbonate
4 to 6 oz. Perfume per 100 lbs.
Color to any desired shade, dispersed with Ethyl Alcohol

Higher Price

75% Foaming Agent
10% Tetrasodium Pyrophosphate Crystals
10% Sodium Sesquicarbonate
5% Inorganic Colloid
0.8% Perfume
Color as desired

Right, top to bottom. Thorough laboratory control assures quality and uniformity of each batch. Texture and foaming strength are tested under actual conditions. Crystallizing and drying one of the basic ingredients. Bottom photo, Lawrence D. Gibson, author of this timely article.

CHEMICAL SPECIALTY *News!*

Harry Tisdale Elected Chairman of New York Section, American Association of Textile Chemists and Colorists—New "Nopco 85" Feeding Oil—Cleveland Paint & Varnish Association to Celebrate its 50th Anniversary at September Festivities

NEW YORK Section of the American Association of Textile Chemists and Colorists elected Harry R. Tisdale, American Dyewood Co., chairman at the May 23 meeting of the section in the Swiss Chalet, Rochelle Park, N. J.

Other officers elected at the meeting were: Patrick J. Kennedy, E. I. du Pont, vice-chairman; Edward R. Schmidt, Borne-Scrymser, treasurer; and N. A. Johnson, American Dyestuff Reporter, secretary. Newly-elected councillors are: Dr. J. E. Meili, Sandoz Chemical Works; Harold W. Stiegler, American Cyanamid; G. Moran, Calco Division; and J. R. Bonner, General Dyestuff.

Annual outing and golf tournament of the organization will be held June 20 at the North Jersey Country Club. Max Kaesche, Sandoz Chemical, is chairman of arrangements.

Take Over Dethol

Du-Rite Chemical Co., Brentwood, recently took over production and sales management of Dethol Manufacturing Co., insecticide manufacturer.

New Dreyer Office

P. R. Dreyer, Inc., essential oils and aromatic chemicals, N. Y. City, opened a Boston office last month at 10 High st. F. Omo Snyder is in charge of the new office and will cover the New England territory. George T. Denby, formerly St. Louis representative for the company is now in the New York office for sales work in the Metropolitan district.

Ralph Hart Feted

Ralph Hart, Hart Products Co., was feted at a surprise testimonial dinner given by friends at the Sky Gardens, St. Moritz Hotel, N. Y. City, recently. Event was a spontaneous gathering of his friends as a tribute to a "Genial Host, Good Friend, and All 'Round Regular Guy." More than 100 guests were present, many of the prominent figures in the textile industry.

Tidy House Leases

Tidy House Products Co., Des Moines, Ia., a division of the American Chemical Co., recently leased a building in Kansas City, Mo., to distribute the company's cleansing and polishing products to dealers in the territory.

Crown Prices Remain

Crown Cork & Seal Co., Baltimore, announced last month that present prices on contracts now in effect will be guaranteed to Sept. 30, 1941.

Paint Group 50 Years Old

Cleveland Paint, Varnish & Lacquer Association will celebrate its 50th anniversary this year and plans are being made for the event which probably will be held in September. Officers for the coming year, it was announced, were elected at the annual meeting of the association held May 23.

New K. A. T. Corp. Office

American K. A. T. Corp., originator of K. A. T. All-Colloidal Water Treatment, has opened a Philadelphia office under the supervision of Frank C. Coe, 15th and Market sts. New office is for sales and service.

In New Locations

Soluol Corp., Natick, R. I., has removed its offices and plant to Green Hill and Market sts.

Conray Products Co., Inc., now is located at new and larger quarters, 510 Sixth ave., N. Y. City. New phone number, Gramercy 7-3514.

George Faux Promoted

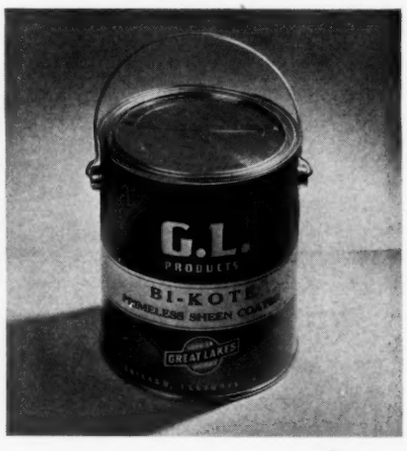
George H. Faux, in charge of the credit department for the past 14 years, has just been appointed assistant secretary to the National Oil Products Co., Harrison, N. J. Mr. Faux will supervise the accounting and cost departments in addition to remaining in charge of the credit department.

Self-Heating Can

Leo Katz, an Austrian chemist, invented a self-heating can for foods four years ago and has finally placed it on the market. Punch a hole in the can, wait 15 minutes and your food is hot, if you like pork and beans, spaghetti and coffee (the only things offered so far). Only drawback of the can is that it weighs three pounds when packed with the necessary chemicals.

Above, Higgins Ink recently introduced a 10 cent size bottle shown here with the standard sized product.

Left, National Oil Products Co. new and economical feeding oil for poultry and live stock packed in sanitary and convenient five-gallon pails and larger drums. Trade name is "Nopco 85."



Above, Great Lakes Varnish Works has introduced a new type of sheen coater which eliminates the use of a priming coat over most surfaces in interior architecture, "Bi-Kote."

THE SATURDAY EVENING POST

NOW'S THE TIME FOR HOME DEFENSE!

▸ Speaking of defense experts, meet the most important little squirt in the house.

It's the squirt that defends your home against flies, and your children against infection. The squirt that makes life unhealthy for mosquitoes—so that they won't make life unhealthy for you. The squirt that protects your clothes against moths, and your garden against insects.

Every "filth columnist" you kill *early* in the summer means that masses of his descendants won't bother you later on. So start your insect blitzkrieg now.

Modern insecticides come to you with their full strength protected, packed safely in cans that neither break nor chip. Buy a can and get going today!

• • •

For best results when spraying for flies or mosquitoes, shut windows and doors so mist will not escape. Use plenty of spray. Aim at ceiling so mist will settle downward.

When using moth crystals or spray, turn pockets of clothing inside out, get at cuffs, pleats, folds, collars, lapels. Washable woolens should first be washed and thoroughly rinsed.

Insecticides—one of the many good things you buy in cans

If you were a businessman ten years ago, you probably remember some of the things that weren't packed in cans at that time . . . MOTOR OIL . . . BEER . . . APPLE JUICE . . . CREPES SUZETTE . . . GRAPE JUICE . . . CHEDDAR CHEESE. Today cans are the modern, convenient package for all of them. What next? You get the answer to that by putting trained technologists, packaging experience and research laboratories to work for you. If your business has a packaging problem, you'll get quick action by bringing it to Continental. Just write Continental Can Company, 100 E. 42nd Street, N. Y. C. Fifty offices and plants in the U. S. A., Canada and Cuba.

CONTINENTAL CAN COMPANY

IF YOU PUT A PRODUCT UP . . . PUT IT UP TO CONTINENTAL

This striking full page, *full color* ad will appear in the June 14th issue of the Saturday Evening Post and is designed to support the manufacturers of insecticides. It's the third of Continental Can Company's Post series promoting products that come in cans, and helping our customers boost sales. Free reprints and a booklet, "Gunning for Extra Sales," are yours for the asking.

BOOKLETS AND CATALOGS

Chemicals

A302. Carburizing Compound; Folder describes "Char" a case hardening material made from coal tar carbon and charcoal. Reilly Tar and Chemical Corp.

A303. Chromium Chemicals; Their discovery, Development and Use. This beautiful, 34-page, spiral-bound book traces the history of chromium, its early uses and sources, discovery in the United States, and then the growth and development of it and its compounds into a major industry. Mutual Chemical Company of America.

A304. Facts About White Paint and Better Illumination; 26-page booklet tells the story of the development of a new white finish, **called** "Save-Lite," for walls, ceilings and structural steel in industrial plants. Also contains a painting guide for industrial maintenance. The Sherwin-Williams Co.

A305. Flexalyn; This 12-page booklet containing technical data on Flexalyn, diethylene glycol diabietate, gives chemical and physical properties. These properties suggest its use in protective coatings, casein paints, wallboard coatings, lacquers, adhesives, plastics, paper coatings, for modifying waxes, softening rubber, transparentizing paper, as a binder in priming coated cloth and in modifving thermosetting plastics. Hercules Powder Co.

A306. Glycerine Facts; June, 1941. Stapled, mimeographed sheets containing following short articles; Electrolytic Polishing of Stainless Steels, Glycerine In Molding Materials, Glycerine as a Quenching Agent for Tempering of Steel, Glycerine as a Heat-Transmitting Medium, Anti-Dazzle covering for Photoflash Bulbs, Glycerine Aids in Photo Printing, Glycerine in Earache Preparations, Window Protection During Blasting, Stainless Finger Printing. Glycerine Producers' Association.

A307. Industrial Chemicals; A listing of products alphabetically and by classes of consumers. Also contains dictionary of products giving applications and properties of various products. American Cyanamid & Chemical Corp.

A308. Key Products Used in the Textile Industry; List and description of chemicals, raw materials and specialties for the textile industry. The description of each article is confined to a brief and condensed summary of its uses and advantages, in order that the folder may prove a useful and ready reference for the reader. American Cyanamid & Chemical Corp.

A309. Mailing Lists for Latin America; A book of information on how to get trade in Latin America. Contains an alphabetical index of lists of manufacturers, dealers and professional men in Latin America with the prices of such mailing lists. Latin America List & Information Service.

A310. Manual on Insulating Varnishes; The purpose of this book is to assist the user in the proper selection and application of insulating varnishes. All varnishes usually required are described in sequence based upon their relative importance, in terms of extent and variety of use. The book is illustrated throughout with pictures, charts and useful tables. Irvington Varnish & Insulator Co.

A311. Metso Cleaners; Folder gives information on a number of industrial cleaners for a variety of uses. Philadelphia Quartz Co.

A312. Multicide; Folder gives specific information on applications of improved insecticide containing pyrethrins and rotenone. McLaughlin Gormley King Co.

A313. Priorities; May, 1941. Contains short story on graphite. Prior Chemical Corp.

A314. Pyrocide 20, Form P-1, 2M-7-39; 20-page illustrated booklet gives information on deodorized, clarified pyrethrum concentrate, contains several interesting items on general facts about pyrethrum, its chemical and biological evaluation, the commercial grades of pyrethrum. It also lists a number of formulas for household insecticides, livestock sprays, mosquito larvicides and horticultural sprays. McLaughlin Gormley King Co.

A315. Silicates of Soda, No. 171; 8-page booklet describes brands, properties and applications. Philadelphia Quartz Co.

A316. Tenite Specifications, Edition 6B; 36-page booklet gives physical properties of new formulas for Tenite, thermoplastic molding composition. Ten formulas are listed from which the molder can choose the one best suited for any given application. Includes detailed tables and charts which give the properties of each formula. Tennessee Eastman Corp.

Equipment—Containers

E472. Bearings; Book No. 1775. This is an 84-page book of real information and engineering data on a large line of friction bearings. Link-Belt Co.

E473. Corroflex Speed Packing Data Sheet No. 6; Folder describes with step-by-step illustration a method that provides rapid packing with a flexible, corrugated material. Sherman Paper Products.

E474. Feed Water Heaters. Bulletin No. 1024; 8-page booklet illustrates and describes high pressure heaters for power plant service. American Locomotive Co., Alco Products Division.

E475. Filters; 44-page catalog, illustrating and describing the latest Staynew and Protectomotor filters for compressed air, gases, liquids, engine and compressor intake, and for building ventilation. Staynew Filter Corp.

E476. Harnischfeger Products, G-2; 12-page booklet describes complete line of power shovels, draglines, cranes, hoists, electric lighting plants, trolleys, welding machines, electrodes, etc. Harnischfeger Corp.

E477. Heat Exchangers, Bulletin 1027; Folder describes and illustrates advantages and design features of transfer line heat exchangers which enable the use of high temperature heat without the hazards of leaks and the disadvantages of coking. American Locomotive Co., Alco Products Division.

E478. High Vacuum Pumps, Catalog No. 75; 8-page booklet illustrates, describes and gives specifications for rotary piston single stage pump. Beach-Russ Co.

E479. Marinite For Oven and Drier Construction, DS Series 585; Technical information on a new type of oven and dryer construction is included in a 10-page data book. Utilizing Marinite, a fireproof structural panel material with high insulating characteristics, typical constructions for walk-in driers and core ovens, tunnel type ovens and lehrs are described with detail drawings. Johns-Manville.

E480. Metalclad Vertical-Lift Switchgear; Bulletin B-6012A. Comprehensive 24-page booklet gives extensive coverage of modern switchgear equipment for application wherever electricity is used or produced. It is profusely illustrated, gives special construction features and advantages, and includes a number of installation views with dimensions, outline drawings and circuit drawings. Allis-Chalmers Manufacturing Co.

E481. Metallizing Equipment and the Metallizing Process, Bulletin No. 42; Describes a process for rehabilitating worn shafts and other rotating machinery and for protecting metal surfaces from corrosion and chemical attack. Describes in detail two types of metal spraying guns and also lists a complete line of metallizing accessories. Metallizing Engineering Co.

E482. Nickelsworth; Second Quarter, 1941; 8-page booklet of pictures and description of some applications of nickel and nickel alloys. Among them are items on the use of Monel and nickel in hydrochloric acid service, nickel-clad steel for pyridine storage, corrosion resistance of nickel in soap boiling kettles and pump shafts for handling strong sulfuric acid solution. The International Nickel Co., Inc.

E483. Oil Testing Instruments for Petroleum Products; Catalog No. 699E. Lists and describes more than 100 different types of oil testing instruments. Some new and improved petroleum testing equipment for acid heat, gum stability, Ramsbottom carbon residue, grease consistency, kinematic viscosity, flash and fire, etc. are illustrated and described in detail. C. J. Tagliabue Manufacturing Co.

E484. Opportunities for Profits With Portable Machine Cutting; This is a revised booklet describing the advantages of oxy-acetylene cutting with portable machines. It gives a variety of applications and several new hints on the use of these machines. The Linde Air Products Co.

E485. Quick-Selector Catalog; 64-page revision of Catalog issued twice yearly. Subjects covered are safety switches, nofuze breakers, multi-breakers, panel boards, motor controls and motors. Revisions include equipment additions, price changes, and up-to-date application data. Electrical ratings, physical dimensions, and circuit diagrams are included to expedite the selection of correct equipment for each use. Westinghouse Electric and Manufacturing Co.

E486. Pre-Fabricated Piping; Folder tells of the advantages and facilities of this type of installation. American Locomotive Co., Alco Products Division.

E487. Process Industries Quarterly; No. 1, 1941. 12-page illustrated booklet lists the principal uses of Monel, "Z" Nickel, "K" Monel, "S" Monel, and Nickel-Clad Steel on Wet End of Fourdrinier Paper Machines. Also gives short items on an abrasion resistant slurry pump, and fat splitting tanks made of Monel, along with several other notes of interest to users of nickel and nickel alloys. The International Nickel Co., Inc.

E488. Propeller Fan Catalog, No. 141; Diagrams and installation photographs explain ventilation by fans. Specifications for a complete line of products are given, together with illustrations, diagrams, etc. of propeller fans, automatic shutters, fan guards, power roof ventilators, dark room ventilators, special high speed fans, portable fans etc. Also contains information on line of motors and blowers. Ilg. Electric Ventilating Co.

E489. Selection and Maintenance of Rubber Transmission Belts, Catalog Section 2150; Gives in simple fashion the steps to follow in selection of proper belts. Also presents results of experience in maintenance of flat rubber belting on such points as belt dressing, cleaning, storing, static, oil and salvage, with suggestions for maintaining belt records. The B. F. Goodrich Co.

E490. Solu-Bridge Controller; 2-page folder describes and illustrates an instrument which indicates concentration of a solution in percentage, parts per million, or other desired terms; operates a visual or audible warning; controls a valve or other corrective means when concentration goes above or below a certain set range. Industrial Instruments, Inc.

E491. Steam Trap Book, Form 120-30-140-2; 36-page booklet of complete information on blast traps for low pressure heating, standard traps for general service, forged steel traps for high pressures and accessories. Gives general information, engineering data and specifications, sizing information, recommended practices and design features. Really an educational handbook on condensate drainage. Armstrong Machine Works.

E492. Technical Data Card No. 103A; lists seamless tubing wall thickness data in millimeters and inches and compares the various gauges in use today. The Babcock & Wilcox Tube Co.

E493. The Tennant Floor Maintenance System; Describes method of keeping floors clean and in good condition without scrubbing with soap and water. G. H. Tennant Co.

E494. What the Purchasing Agent Should Know About Oxy-Acetylene Welding and Cutting Equipment and Processes; 12-page illustrated booklet designed to help the user or prospective user obtain an understanding of the process and various construction and operating features of welding and cutting apparatus. Contains a guide to the selection of proper type of equipment, with a check list of important points to consider. Also contains a list of some modern applications. The Linde Air Products Co.

Chemical Industries
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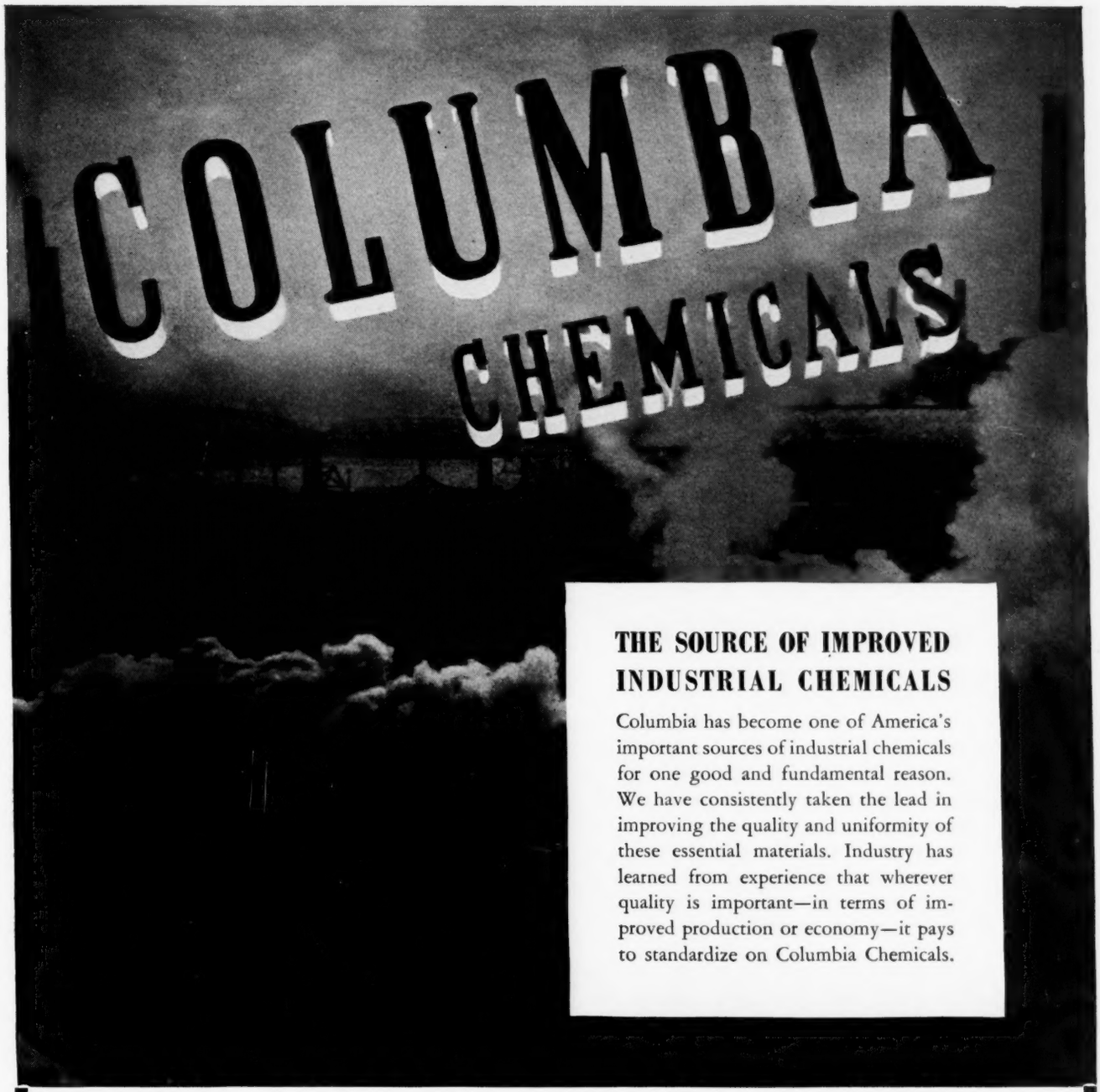

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ADVERTISING PAGES REMOVED

Personalities in Chemistry

(*Continued from page 717*)

of his work, he developed an economically important process for producing copper from low-grade ores by the use of sulfur dioxide in hydrometallurgy.

In July of 1916 Weidlein returned to Pittsburgh as Assistant Director of the Institute; on October 1, 1916 he was appointed Associate Director, and he was acting director throughout the World War. On October 28, 1921, Weidlein was made Director of Mellon Institute. He is also vice-president of the board of trustees of the Institute, as well as a trustee of the University of Pittsburgh, with which the Institute is allied cooperatively.

Active in Experimental Work

The doctor's heavy administrative duties naturally preclude his active and regular participation in the experimental work. He maintains intimate contact with each fellowship, however, and can apprise the donor of the precise state of any one of the investigations in progress. A major duty of the director, calling for insight and knowledge of the needs of industry, is the selection of subjects for research. Almost of equal difficulty and importance is the matter of selecting a fellow for the new undertaking, for Weidlein has built up a staff founded upon the principle of cooperation. The old slogan, "All for one and one for all", applies—the one being the Institute.

Weidlein was born July 14, 1887, at Augusta, Kansas, being the son of an oil producer. In appearance and action he would hardly be taken for more than forty. His father, now 86 and very active, is of German ancestry; his mother was of Scotch-English descent. He was educated in the public schools of Kansas, supplemented by professional courses at the University of Kansas, where he was graduated in 1909 with the Bachelor of Arts degree; and the following year he was awarded the Master of Arts degree. Tufts College, Rutgers University, the University of Pittsburgh, and other institutions of learning have conferred honorary degrees upon him.

During World War I he was a dollar-a-year man associated with the Chemical Division of the War Industries Board, for which services he received the highest official commendation. In the present national defense plans he is serving likewise as chief of the Chemicals, Drugs and Allied Products Section of OPM, the latter requiring the doctor to spend about half his time in Washington. "Though the chemical industries during the past decade have been as far away from the munitions business as it is possible to get them," says Weidlein, "the problems confronting our group at present are minor compared with conditions in 1917."

Weidlein is the author of a large number of scientific papers and articles on industrial research achievements, opportunities, and procedures, and (jointly with William A. Hamor) of two popular treatises entitled "Science in Action" (a book that describes industrial research methods and successes) and "Glances at Industrial Research" (a comprehensive, compact, authoritative, readable account of the recent advances, present status, and future opportunities of industrial research as discerned at Mellon Institute).

He is a member, either active or honorary, of most of the scientific clubs or societies of the world, as well as of six leading fraternities. He has served as president of the American Institute of Chemical Engineers, of the American Chemical Society, and of both the University Club in Pittsburgh and the Faculty Club of the University of Pittsburgh.

Cognizant of the romance and practicability of science, coupled with the rare ability as a speaker to imbue his listeners with his own enthusiasm, Weidlein finds himself able to fulfill only a few of the many requests to deliver addresses made of him. In fact for years he let his speaking tours serve as his vacation. "I rarely take a vacation as such", he says, "I get around enough in the regular duties of my position."

An Outdoor Sportsman

Though a member of both lacrosse and tennis teams during his college days, his exercise nowadays is limited to golf—"but not too seriously"—hiking, trout fishing, hunting, and gardening. Regarding the latter, the youthful interest in botany has not subsided, for Weidlein takes an interest in every living plant about his home—even to the grass, for he explains with his characteristic and contagious enthusiasm how he cultivates the beautiful lawn about his home.

Weidlein leads a full life not only in his profession but in his avocations, each of which reveals phases of his make up. He is a director of the Allegheny County Council of the Boy Scouts of America; he is a 32nd degree Mason; a trustee of his church and also of Shadyside Academy in Pittsburgh. And his first ambition of life—to be a banker—is somewhat satisfied, for he is a director of the Forbes National Bank of Pittsburgh.

The doctor, together with his wife and three sons, resides at 325 South Dallas Avenue, Pittsburgh. His elder son, Edward Ray, Jr., is now doing graduate work in chemistry at Penn State leading to the doctorate degree.

Foreign Literature Digest

(*Continued from page 723*)

regard to the purification of the air and the production of elementary sulfur and recovered carbon bisulfide for further use in manufacture.

The recovery of gases in the viscose industry is characterized by the following specific conditions:

1. Extreme dilution of the gases: 50-200 mg/cu.m. of CS_2 and 12-30 mg/cu.m. of H_2S;
2. Large quantity of discarded air;
3. High moisture content;
4. Heterogeneity of composition—H_2S, CS_2, SO_2 and CO_2.

A number of chemical methods are listed which are unsuitable for various reasons. Among the methods tested at the institute were:

Sodium hydroxide method. Hydrogen sulfide was absorbed by a caustic soda solution in an apparatus and by methods which are described in detail. This method was found unprofitable due to cumbersome apparatus, expensive equipment, low coefficient of utilization of the caustic soda and considerable cost of operation.

Ozone method. Hydrogen sulfide is readily oxidized by ozone to free sulfur. An ozone generator is described. This method has a promising future for the oxidation of hydrogen sulfide, carbon bisulfide and other such compounds in the gaseous phase.

Permanganate method. The ideal method of hydrogen sulfide recovery from air would be its oxidation by the oxygen of the air. A catalyst, such as active manganese dioxide has been suggested to accelerate its oxidation. Active manganese-dioxide was obtained by passing hydrogen sulfide through a saturated solution of potassium permanganate. The air was completely purified of hydrogen sulfide but the process has one drawback. A considerable drop in air pressure on the absorber occurs during its application. This method is inapplicable due to the necessity of using expensive absorbers of the tower type, considerable drop in air pressure in the absorbers which requires a large expenditure of electrical energy, and a deficiency of potassium permanganate.

Absorption of Hydrogen Sulfide by Activated Carbon. This type of recovery is based on the oxidation of the hydrogen sulfide molecules to free sulfur on the surface of the activated carbon by means of the oxygen molecules of the air. As the sulfur is deposited on the surface of the activated carbon its activity and capacity for absorption decrease. Experiments were conducted with several different kinds of activated carbon in difficult dimensions, at varying temperatures and

(*Continued on page 785*)

Knight Receives A. I. C. Medal

Dr. Henry G. Knight, Chief of the Bureau of Agricultural Chemistry and Engineering, U. S. Department of Agriculture, receives the Medal of the American Institute of Chemists from the hands of Vice-President of the United States, Henry A. Wallace, at the annual banquet held on May 17 at the Wardman Park Hotel in Washington, D. C.

Above at the right, seated left to right, Prof. Donald H. Andrews, Johns Hopkins University, principal speaker at the afternoon session; Frank O. Lundstrom, Assistant Chemist, Bureau of Agricultural Chemistry and Engineering; M. R. Bhagwat, Chemist Advisory Council; and Dr. Marston L. Hamlin, The Barrett Company. Below, Dr. Harry L. Fisher, Director of Organic Research, U. S. Industrial Chemicals, Inc., and President of the A. I. C.; Dr. Gilbert E. Seil, Technical Director, E. J. Lavino and Company; and Dr. Robert J. Moore, The Bakelite Corporation.

Right, H. F. Payne, American Cyanamid's Stamford laboratories, and Prof. Raymond E. Kirk, Polytechnic Institute of Brooklyn. Below, general picture of the banquet.

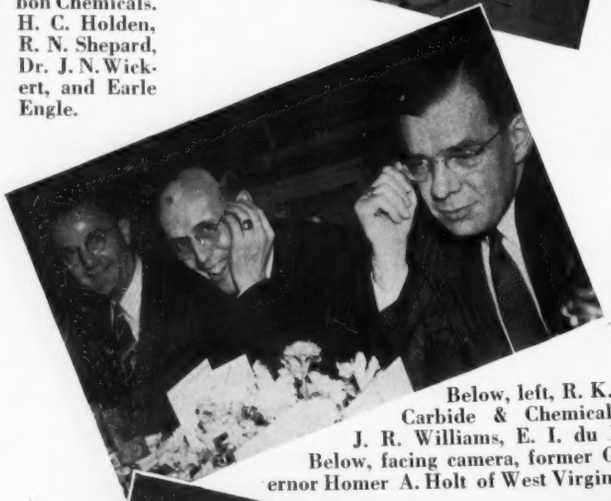
A Day in Charleston

Walter J. Murphy, editor of *Chemical Industries*, addressed a joint dinner meeting of the Charleston Section, A. I. Ch. E., and the Charleston Chamber of Commerce, May 23, on "The Chemical Industry in the National Defense Program." (See left photo.)

Upper left photo, Dr. John S. Beekley, Manager, Process Section, Belle W. Va. Works, Ammonia Dept., E. I. du Pont, (left) and Walter J. Murphy. Above photo, Dr. H. L. Cox, Carbide and Carbon Chemicals (left) and J. A. Mooney, Westvaco Chlorine Products Co.

Above, all from Carbide & Carbon Chemicals. H. C. Holden, R. N. Shepard, Dr. J. N. Wickert, and Earle Engle.

Below, left to right, N. W. Welton, D. B. Wicker, C. E. Hendrixson, J. E. Spalding, all of American Viscose.



P. A. Herscher, Kanawha Banking & Trust, R. N. Shepard, and W. S. Brackett, Carbide & Chemicals.

Below right, left to right, Rev. H. Mees Meyer, Mayor D. Boone Dawson and Charles E. Hodges, Charleston Chamber of Commerce.

Below, left, R. K. Turner, Carbide & Chemicals, and J. R. Williams, E. I. du Pont. Below, facing camera, former Governor Homer A. Holt of West Virginia.

SHARPLES ALKYLAMINO-ETHANOLS

	ETHYL * MONOETHANOL-AMINE	ETHYL * DIETHANOL-AMINE	DIETHYL † AMINO-ETHANOL	n-BUTYL * MONOETHANOL-AMINE	n-BUTYL * DIETHANOL-AMINE	DI-n-BUTYL * AMINO-ETHANOL
COLOR AND FORM	COLORLESS LIQUID	COLORLESS LIQUID	COLORLESS LIQUID	COLORLESS LIQUID	LIGHT STRAW LIQUID	COLORLESS LIQUID
PURITY	99-100%	99-100%	99.5-100%	97-99%	97-99%	98-99%
MOLECULAR WEIGHT	89.1	133.1	117.2	117.1	161.2	173.2
SPECIFIC GRAVITY @ 20°C	0.914	1.015	0.88-0.89	0.892	0.970	0.859
LBS. PER GALLON	7.61	8.46	7.36	7.44	8.09	7.16
DISTILLATION RANGE °C	160-167	246-252	158-163	194-204	268-291	224-232
FLASH POINT °F	160	255	135	170	245	200
REFRACTIVE INDEX @ 20°C	1.4415	1.4678	1.4413	1.4455	1.4632	1.4446
SOLUBILITY IN WATER	MISCIBLE	MISCIBLE	MISCIBLE	MISCIBLE	MISCIBLE	SLIGHTLY SOLUBLE
SOLUBILITY IN ALCOHOL	MISCIBLE	MISCIBLE	MISCIBLE	MISCIBLE	MISCIBLE	MISCIBLE
SOLUBILITY IN PARAFFIN HYDROCARBONS	MISCIBLE	INSOLUBLE	MISCIBLE	MISCIBLE	MISCIBLE	MISCIBLE

† COMMERCIAL PRODUCT
* SEMI-COMMERCIAL PRODUCT

Interesting combinations of properties of alkyl and alkylol amines are exhibited by Sharples alkylaminoethanols. Those which have a preponderance of ethanol groups in the molecule are more water soluble and less soluble in oil than the ones in which the alkyl radical predominates. This is also true of the corresponding fatty acid soaps which exhibit interesting properties as emulsifying agents. These amines are suggested for use in the textile, pharmaceutical, and dyestuffs industries.

Diethylaminoethanol is commercially available and the others can be manufactured in similar quantities upon relatively short notice.

These and other interesting new compounds are described in the 12th Edition of "Sharples Synthetic Organic Chemicals", a copy of which will be sent on request.

SHARPLES CHEMICALS INC.

PHILADELPHIA CHICAGO NEW YORK

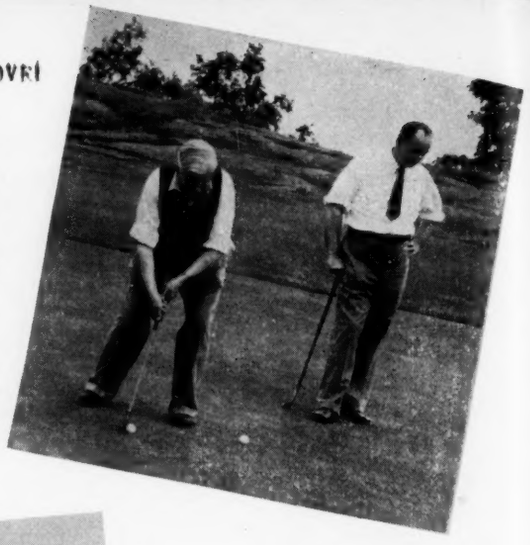
SHARPLES TRADE MARK CHEMICALS

ADVERTISING PAGES REMOVED

Chemists' Club Golf Tournament

Members of the Chemists' Club traveled to the Bonnie Briar Country Club, Larchmont, N. Y., last month for their annual golf tournament. Low gross winner was E. B. Curtis, second Dr. R. F. Bacon. Low net was won by Kenneth Klipstein with R. C. Champlin, second. R. E. Dorland won the Round Table Trophy. On this page are some pictures of the event; 85 attended.

Left, "Babe" Prior, DeWitt Thompson and W. F. George at the committee table just before presentation of last day's trophies.



Right, Ralph E. ("One-Putt") Dorland, sinking a long one while R. H. De Greeff waits for his turn.

Right, Bonnie Briar Country Club.

Below, Larry French, Oldbury Chemical, looks longingly at the pitch of the 18th hole just before his last putt of the day.

Below, Myron Bantreli, Filtrol Co., Los Angeles, was one of the interested spectators at the meet.

Right, Kenneth H. Klipstein, Calco Chemical, who won the Carleton Ellis Trophy and the Prior Trophy for his low net score.

Center photograph bottom, Harold Fyffe, "Doc" Ebert and Bill Neuberg pause at the 9th hole to see how they are doing. Below, William Callan, Casein Co., sinks a putt.

Below, Dave Jackson, Croll-Reynolds.

NEWS OF THE MONTH

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Goodrich Ameripol Production Boost Announced

In a coast-to-coast broadcast last month of the progress made with Ameripol, B. F. Goodrich's synthetic rubber, in the year since it was discovered, John L. Collyer, president, announced last month that output is being boosted from 2,500 tons a year to 5,000 tons. Almost simultaneously, the RFC voted an appropriation of $5,000,000 for four additional synthetic rubber factories in the country with combined capacity of 10,000 tons annually. This will further boost Ameripol production to 7,500 tons. (Ameripol is from butadiene, petroleum by-product.)

IN REVIEW

CHEMICAL INDUSTRIES

COOPERATION STRESSED BY PURCHASING AGENTS

Work With Government on Defense Program, Nation's Purchasing Agents Are Urged at 26th Annual International Convention of National Association at Chicago—Price Says War Effort Comes First—Brady Urges Pooling Substitute Material Knowledge

TODAY'S problems in business and industry—problems of cooperating directly or indirectly with the government defense program in order to prepare the nation for any emergency—formed the background of the 26th annual international convention of the National Association of Purchasing Agents at the Stevens Hotel, Chicago, May 26-29. An estimated 2,000 purchasing agents and guests were at the convention.

In his speech opening the convention, George E. Price, Jr., president of the association and purchasing agent of the Goodyear Tire & Rubber Co., told the group that our war effort comes first but our nation's security depends also on an ability to keep going as we were before. He stressed the fact in his speech that as few changes and adjustments as possible will be necessary to complete the government program and when that program is completed or at a normal basis our non-defense industries will not be required to make changes to restore normalcy again.

F. Albert Hayes, American Hide & Leather Co., Boston, was elected president of the association for the coming year.

Pool Knowledge of Substitutes

Rapid pooling of knowledge of substitute materials to replace those in scant supply was urged by Col. George S. Brady, chief of the substitute and secondary materials section of the Office of Price Administration and Civilian Supply in his address before the convention. He estimated that American concerns will spend $1,000,000 on research this year. He said that shortages and rising prices will be felt by consumers on goods from the Far East because cargo space usually allotted to their transportation has been taken to move rubber to this country. In pointing out some of the moves we shall have to take toward using substitutes, he said, that any temporary substitutes for aluminum will not impede the growth of that industry. The three metal industries that will have to expand the most, he said, are aluminum, magnesium and beryllium.

Philip D. Reed, senior consultant to the priorities division and chairman of the board of General Electric, said that any stocking up of inventories beyond normal requirements is sure to deprive other defense manufacturers of needed materials or to shut down unnecessarily the manufacture of peacetime goods.

William S. Knudsen, director general of OPM reported that 14,000 prime contracts and about 60,000 sub-contracts have been let and that there should be at least three times as many. Leon Henderson of the Office of Price Control pointed out his job in the program and predicted that the next few months would see a tremendous amount of support by American industry for expansion programs, for conservation, for standardization, for simplification and for substitutes.

W. E. Bittner, purchasing agent for Diamond Alkali, in a convention address said that there are three policies which industrial buyers should cultivate under present conditions: (1) a reasonable attitude toward suppliers, (2) forward planning on requirements and (3) conservative purchasing. "Buying far into the future is hazardous," he said, "and under present conditions, many such purchases must necessarily include escalator clauses and price-in-effect clauses. Many of us are not in sympathy with the idea of buying so far ahead, but do not see any alternative. It will be easy to explain to the management after this is over why we have stocks sufficient to carry us for four months, but it is impossible to explain why a department or plant is down due to lack of materials or supplies." His talk, "Wartime Expediting," went on to tell what can be done by purchasing men in this situation.

At the luncheon meeting of the chemical and allied products group, E. J. Parent, Mathieson Alkali, acted as chairman and introduced Dr. Carl S. Miner, Miner Laboratories, Chicago, who spoke on "Chemistry Moves On."

Donald M. Nelson, director of purchases of O.P.M., was presented with the J. Shipman Gold Medal award of the association. He urged industry to boost its production of war goods and emphasized that a speedup to $35,000,000 annually was needed to match Germany's production output.

SUBSTITUTIONS

Examples of Changes Which Have Reached, or Now Approach, the Quantity Production Stage

Description of Article	Former Material	Substitute Material	Cost After Change
REFRIGERATOR			
Ice Cube Trays	Aluminum	Tinned Copper; Steel	Higher
Door Handles	Die Cast Zinc	Injection Plastic	Same
Interior Fronts	Aluminum Stamping	Steel, Cadmium Plate	Same
Trim on Humidifier	Aluminum	Plastic	Lower
Thermo Housing	Aluminum	Stainless Steel; Plastic	Lower
Evaporator	Stainless Steel	Tinned Copper; Enamel on Steel	Higher
Hydrator	Enameled Steel	Pliofilm Zipper Envelope	
RANGES AND HEATERS			
Gas Burner Head	Aluminum Die Cast	Cast Iron	Lower
Vent Grill	Aluminum Cast	Steel Stamping	Lower
Kerosene Tank	Zinc	Glass	
Range and Heater Trim	Chromium or Nickel Steel	Plastic	
Kerosene Range Kindler	Asbestos	Woven Glass Fabric	
OTHER HOUSEHOLD EQUIPMENT			
Cooking Utensils	Aluminum	Enamel on Steel	Higher
Kitchen Cabinets	Steel	Wood	
Dinette Table Tops	Steel	Laminated Wood	
Cutlery	Nickel Silver	Discontinued	
Fly Screens	Bronze	Plastic	
Washing Machine Agitator	Aluminum	Bakelite	Lower
Washing Machine Clutch Handle	Die Cast Zinc	Bakelite	
Vacuum Cleaner Dome	Die Cast Aluminum	Injection Plastic	Lower
SMALL TOOLS			
Lathe Face Plates	Aluminum	Cast Iron	Higher
Electric Tools—Handles	Aluminum	Plastic	Lower
Saw Guard	Die Cast Zinc	Plastic	
FARM EQUIPMENT			
Wire and Fence	Galvanized Steel	Corronized Steel	
CONSTRUCTION			
Rigid Electrical Conduit	Galvanized Steel	Black-Enamel on Steel	
AUTOMOBILE BODY PARTS	Steel	Soy Bean Fiber Laminated Plastic	
SPORTS			
Boat Whistle	Chrome Plate Brass	Plastic	Lower
Skeet Trap	Aluminum Cast	Cast Iron	Lower
Ski Pole Rings	Aluminum Rod	Rattan	Same
Camera Case	Aluminum Cast	Plastic	Lower
Film Spool	Aluminum	Plastic	Lower
Thermos Bottle Top	Aluminum	Plastic	Same
Bicycle Frame	Steel	Laminated Plastic Plywood	

Above chart is taken from Dun & Bradstreet's recent booklet "The War of Metals" which is discussed on page 780, this issue with market comment.

STAUFFER CHEMICALS

CARBON BISULPHIDE

A clear, water-white product testing 99.99% pure, Stauffer Carbon Bisulphide is one of a selected list of basic chemicals produced by Stauffer Chemical Company. Prompt deliveries can be made in any quantity from five-gallon drums to fifty-ton tank cars, from strategically located plants, serving the Chemical Industry from coast to coast.

OTHER STAUFFER PRODUCTS

BORIC ACID : CARBON TETRACHLORIDE : BORAX : TITANIUM TETRACHLORIDE : SULPHUR CHLORIDE : SILICON TETRACHLORIDE : CREAM OF TARTAR : SULPHURIC ACID : TARTARIC ACID : WHITING LIQUID CHLORINE : CAUSTIC SODA : TEXTILE STRIPPER : SULPHUR

PACIFIC COAST PRODUCTS

SULPHATE OF ALUMINA : COMMERCIAL MURIATIC ACID : COMMERCIAL NITRIC ACID : COPPERAS : SUPERPHOSPHATE : NITRATE OF POTASH

Stauffer CHEMICALS

A dependable source of supply

STAUFFER CHEMICAL COMPANY

420 LEXINGTON AVE., NEW YORK, N. Y. — 624 CALIFORNIA ST., SAN FRANCISCO, CAL.
555 SO. FLOWER ST., LOS ANGELES, CAL. — 230 NO. MICH. AVE., CHICAGO, ILL.
FREEPORT, TEXAS — APOPKA, FLORIDA — 424 OHIO BUILDING, AKRON, OHIO

GOVERNMENT

I. G. Funds Now N. G.

Anti-trust division of the Department of Justice last month got two court orders which were executed, freezing the assets of I. G. Farbenindustrie in this country. First order obtained May 9 tied up I. G. funds in the National City Bank, including $250,000 due to be paid that day to the German concern by American companies operating under I. G. licenses.

Second court order was signed by Federal district court Judge Conger and was for the seizure of all I. G. goods, property, accounts and credits held by the General Dyestuff Corp.

I. G. was first indicted Jan. 30 as a party to the alleged magnesium trust. I. G. refused to respond to the indictment contending that it was not doing business in this country and was not subject to American law.

Fertilizer Indictment

One-hundred fertilizer manufacturing companies and individual officers of those companies who are charged with violating the Sherman Anti-trust Act will come up for trial Jan. 5, 1942. Of the original 102 defendants, 77 pleaded "not guilty," 23 pleaded "nolo contendere," while the government entered a "nolle prosequi" as to two defendants, the Arkansas Fertilizer Co. and John F. Maybank.

Motions to quash the indictment were denied. The trial, it is estimated, will take six or eight months.

Back of the year's investigation by a 23-man grand jury impanelled at the instigation of the anti-trust division is the story of an effort to see what makes the fertilizer industry tick. After a fruitless fight to prevent the seizure of company records going back over a period of 10 years (one company's contributions "filling up two boxcars"), failure of an injunction appeal finally sent the records to Winston-Salem and the grand jury got to work.

What the grand jury said it found out is now a matter of record and the $200,000,000 fertilizer industry is awaiting further developments. According to the indictment the interests of more than 2,000,000 fertilizer-user farmers are affected. The defendant companies are said to control in excess of 75% of the annual U. S. distribution.

More than 50% of the total production of fertilizers in this country is consumed in 6 southern states, principally on cotton, tobacco and corn crops.

An advisor to the anti-trust division of the department of justice recently said in a report to the so-called anti-monopoly committee: "Nominally the grand jury has the power to indict or refuse to indict; in reality it usually does the will of the prosecuting attorney into whose hands the real discretion has passed." Even in such one-sided government proceedings, the grand jury in this instance required one year before it decided that the fertilizer companies should be formally accused.

Arnold on Seizing Patents

Assistant attorney general Thurman Arnold who is quite a busy man these days announced recently that Congress soon would get a recommendation to give the government the right to authorize or condemn for use patents deemed necessary to the defense program. Arnold is assisting the Temporary National Economic Conference Committee in preparing its final report of the recommendation.

Other moves contemplated on Mr. Arnold's program, according to his announcement, are: legislation to eliminate the use of patents contrary to the policy of the anti-trust laws; investigations of at least 31 industries producing vital war supplies in which there occurred price increases, artificial shortages and foreign control; and provision that the power of the FTC should be enlarged to permit it to hear evidence and make findings of fact and conclusions of law in pending anti-trust proceedings.

Mr. Arnold revealed that lack of funds for the Department of Justice is holding up these investigations which will include the chemical and metal fields and the cottonseed situation. Action by the anti-trust division, he said, already has prevented price increases in potash, nitrogen and oil.

OPM Paint Committee

New advisory committee to the protective coating section of the division of purchases of OPM was announced last month by J. B. Davis, special advisor of the Office of Production Management. Prime purpose of the committee is to provide the mechanics for assuring to the government the fullest cooperation of the paint, varnish and lacquer industry in solving the problems of the defense program. Especially sought is the least possible disruption of the regular manufacturing program of the industry and the least possible interference with civilian requirements.

Years Not Months of Planning Says Priorities Consultant

Non-defense industries must plan for "a period not of months but of years" to get along with much less than their requirements in a long list of strategic materials, Philip D. Reed, chairman of the board of the General Electric Company, said recently at the 25th annual meeting of the National Industrial Conference Board at the Waldorf-Astoria Hotel.

Mr. Reed who is Senior Consultant to the Director of Priorities of the Office of

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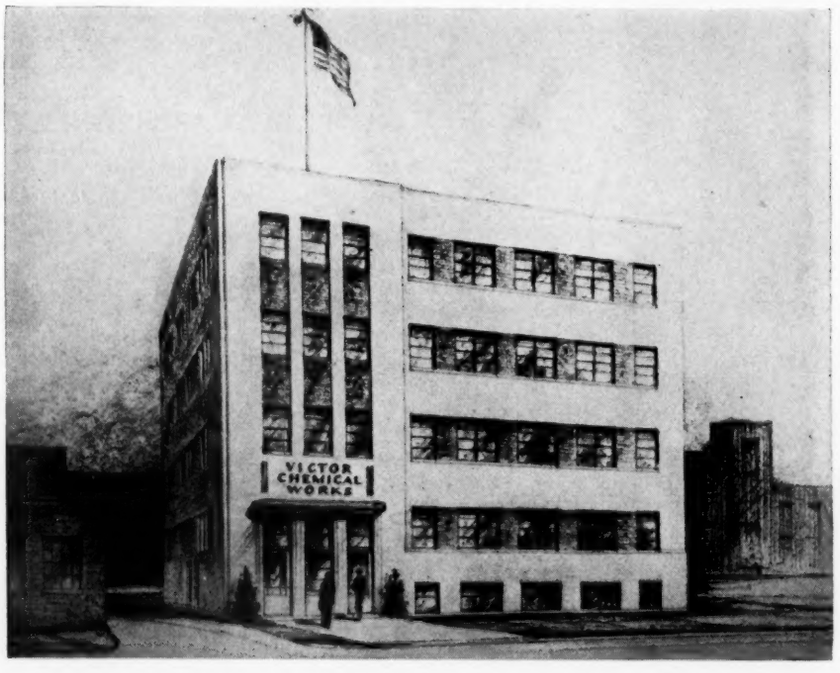
New Victor Chemical Building Ready This Fall



Work has been started on this four-story modern building at the plant of the Victor Chemical Works, Chicago Heights. Completion is scheduled for September. Company now has 25 buildings on the 10-acre site.

New building, which will be 61 x 67 feet will cost approximately $165,000 with equipment. It will have six new research laboratories, enlarged baking research laboratory, chief chemist's offices, engineering department, kitchen and dining room for employes.

Production Management in Washington, said that "the sooner we accept the fact, for purposes of planning, that we face a long period of enormous production for defense, with a consequent shortage, rationing and allocation of strategic materials, the more quickly will non-defense industries adjust themselves to the new conditions and undertake the great task of maintaining maximum production for civilian needs without interference with defense output."

O'Neill Appointed to OPM

New deputy director of OPM Division of Priorities in charge of operations is James L. O'Neill, operating vice-president of Guaranty Trust Co., N. Y. City.

Other Government News

President Roosevelt asked Congress recently to provide for an immediate appropriation of $525,000 to improve the Amarillo, Tex., helium plant and to increase its capacity. Part of the money sought would be used to investigate helium gas resources.

A Venezuelan chemical engineer brought to Washington recently a few lumps of the soft red mineral, cinnabar, from which mercury is extracted, taken, he said, from a section near Valencia, Venezuela. Washington geologists found the mineral to be from 3 to 17% pure mercury and are investigating the possibility of uncovering what may be the richest mercury deposit on earth in that section.

GENERAL

30 Years of Mellon Research

Thirtieth anniversary of the operation of Mellon Institute's research procedure in collaboration with the University of Pittsburgh was marked by the extension of the range of activities to broad service in national defense. The present emergency has induced much more investigation on problems having important relations to the country's future welfare. Ninety-three industrial fellowships, of which 32 are multiple and 61 individual, have been at work in the institute during its fiscal year, March 1, 1940, to March 1, 1941. These investigations have employed 187 fellows and 114 fellowship assistants. During this fiscal year the institute has spent $1,258,866 in conducting these research programs and its comprehensive studies in pure science, which have been assuming more and more professional and public importance, according to the twenty-eighth annual report of the director, Dr. E. R. Weidlein, to the trustees of the institution.

Bauxite Contracts

Contracts providing for substantial deliveries of high-grade bauxite were signed last month between R. S. Reynolds, president of Reynolds Metals Co. and J. van den Broek, managing director, N. V. Billiton Maatschappij, owner of aluminum ore tracts in Surinam, Dutch Guiana. Deliveries are to be made at Mobile, Ala.

Reynolds operates an alumina plant at Lister which will feed aluminum reduction plants and a new plant being constructed at Longview, Wash.

Plastics Competition

Modern Plastics Magazine is now sponsoring its Sixth Annual Modern Plastics Competition, an important and significant event of the year in the plastics industry. Sponsors of this annual competition invite all plastic-using firms, designers, molders, laminators, fabricators, materials suppliers, machinery and die makers to participate.

Any plastic object or product will be deemed eligible if it has been designed or has reached the market since September 1st, 1940. Competition and concurrent display of entries will be held in the main headquarters of Modern Plastics, Chanin Building, 122 East 42nd street, New York City. Final deadline for all entries is September 8th.

Draft Pay

Men of military age in the Schering Corporation, Bloomfield, N. J. pharmaceutical manufacturer, will be kept on the payroll during the full period of their military service if they are drafted or if they volunteer, company officials announced recently.

Considering such employees as on a leave of absence, Schering has arranged to pay drafted employees a percentage of the difference between their army pay and their last monthly salaries.

New Standards Pamphlet

National Bureau of Standards, Department of Commerce, announced last month the publication of a new pamphlet entitled "Phenolic Disinfectant (Emulsifying Type, 2d Edition), Commercial Standard CS70-41 and Phenolic Disinfectant (Soluble Type, 2d Edition), Commercial Standard CS71-41." Contained in the pamphlet are two commercial standards accepted by the trade as standards of practice for new production beginning Feb. 1, 1941, as announced Jan. 17, 1941.

Printing Plate Research

A three-year research program directed toward the development of new and improved products and operating methods for use in the printing-plates trades and industries has been launched by Printing Plates Research, Inc., in the laboratories of Battelle Memorial Institute, Columbus, O. According to Clyde E. Williams, director of the institute, program will be under the direction of Dr. Bruce W. Gonser and Dr. R. M. Schaffert of the technical staff.

Lalor Fellowships

Board of Trustees of the Lalor Foundation announced last month the following fellowship awards in chemical and biochemical research for the academic year 1941-42:

$2,000 to Frederick W. Barnes, Jr., to work at Columbia University under Dr. Hans T. Clarke on the investigation of intermediary metabolism with the aid of isotopes.

$2,500 to A. Calvin Bratton, to continue work at Johns Hopkins University Medical School under Dr. E. K. Marshall on chemical aspects of chemotherapy of compounds of the sulfanilamide type. (This award is for $1,250 per year for a period of 2 years, namely, for 1941-42 and 1942-43.)

$2,000 to Robert B. Carlin, to work at the University of Illinois under Dr. Roger Adams on the determination of the structure of the alkaloid extracted from Crotalaria spectabilis and of analogous alkaloids from various Senecio species.

$2,000 to William W. Rice, to work at Harvard University under Dr. A. B. Lamb on a theoretical and experimental investigation on the adsorption of gases on various materials.

CI Exposition Filling Up

With the 18th Exposition of Chemical Industries still six months away, 95 per

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New Allegheny Ludlum Steel Warehouse

Allegheny Ludlum Steel Corp. recently completed this new combined office and warehouse building, designed for prompt and efficient handling of special steel requirements, in Los Angeles, Cal.

cent of the space has already been engaged. Exposition is scheduled to be held Dec. 1-6 in Grand Central Palace, N. Y. City.

More than 40,000 executives, factory managers, technologists and engineers registered at the last Chemical Exposition, which was held in New York two years ago, and it is expected that the audience will be considerably augmented this year.

Electrochemical Foods?

Electrochemistry, responsible for many commercial processes, may before long produce foods and textiles, according to *The Pioneer*, monthly magazine of Niagara Alkali Co. and Electro Bleaching Gas Co.

Copies are available without charge to any user of caustics or liquid chlorine upon request of Niagara Alkali Co., N. Y. City.

Patent Law Lectures

A comprehensive series of 20 lectures on Current Problems in Patent Law will be given as a part of the Summer session program of the Practising Law Institute, 150 Broadway, N. Y. City. Sessions are from July 14 to 18.

History of Asbestos

The uses, history and characteristics of asbestos are discussed in the June issue of *Priorities*, house magazine of Prior Chemical Corporation, N. Y. City.

New Paint Freight Rates

Illinois Central System recently filed notice of intention to establish class 40 rates on paints, varnishes, lacquers and other finishes, minimum weight 20,000 pounds, between points in the South served by the Illinois Central and Illinois and Indiana points. New schedule will represent a further reduction of 20 per cent on volume movements, if it goes through.

Defense Against Insects

"A Home Defense Program against all Insects," is the theme Continental Can features in its advertising for the June 14th issue of the *Saturday Evening Post* to call consumers' attention to the products of the insecticide industry.

New Dishwashing Compound

New cleaning compound, in briquet form, for use in dishwashing machines was introduced recently by Mathieson Alkali. Known as Super-Mafos, it is a combination of six detergents which are effective on food residue, together with a water softener. These constituents are subjected to a low-temperature fusion process and the resulting mixture is formed into hard briquets.

By using these briquets in connection with an automatic feeding device, also a Mathieson development, the strength of the wash water is maintained at the proper point at all times.

Symposium on Plastics

Symposium on plastics was held by the Chicago Rubber Group, June 6, at the Congress Hotel, at which 23 chemical companies had exhibits showing latest chemicals for use in the rubber industry. W. C. Goggin, Dow Chemical, spoke on the history and development of new plastics for industry. W. F. Cullom, Jr., Celluloid Corp., discussed the history of cellulose nitrate and acetate. T. W. Sharp, Carbide & Carbon Chemicals, Chicago, presented as his subject the new vinyl resins.

Industry members interested in programs of the group are urged to communicate with Ben W. Lewis, secretary-treasurer, care of Wishnick-Tumpeer, Inc., Tribune Tower, Chicago.

ASSOCIATIONS

Drake Filled for Paint Meet

Since the Drake Hotel, Chicago, convention headquarters for the 1941 convention of the National Paint, Varnish & Lacquer Association, Oct. 29, 30, 31, already is booked full by the rush of early reservations, members who have not already done so are urged to send their

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Commercial Solvents Celebrates Twenty-first Anniversary

The 21st birthday anniversary of Commercial Solvents was celebrated May 8, with a dinner-dance held at Terre Haute, Ind. Over 600 were in attendance including executives from the New York office and from the other plants of the corporation. Henry E. Perry, Vice-President, acted as toastmaster, Major T. P. Walker spoke. Featured event of the evening was the surprise announcement of the formation of the "Twenty Year Club." Maynard C. Wheeler, Production Manager, presented the 35 candidates and Major Walker gave to each one a handsome gold watch suitably inscribed to commemorate the occasion. (Parent plant is at Terre Haute, Ind.)

reservations to the Knickerbocker Hotel, directly across the street from the Drake.

Textile Chemists Meet

American Association of Textile Chemists and Colorists held its last 1940-41 meeting May 23 at the Swiss Chalet, Rochelle Park, N. J. J. O. Amstuz, chief engineer, Behr Manning Corp., Troy, presented a paper on "Electrocoating Fabrics." The association's annual outing and golf tournament will be held June 20 at the North Jersey Country Club.

Olive Oil "Who's Who"

Olive Oil Association of America, Inc., recently compiled a "Who's Who" of its officials. Among the merchant leaders of the association are: Walter A. Benz, president, who is vice-president of Strohmeyer & Arpe; Carlo Bertolaia, vice-president, who is secretary-treasurer of Mattia Locatelli; Anthony J. Bendin, vice-president, who is president of Bortolo Bendin; and M. Charles Segui, secretary-treasurer, who is president of Briones & Co.

Recognizing that abnormal and changing conditions may seriously affect the industry, the association has appointed a number of additional committees to cope with new problems as they develop.

Production Step-Ups

How to step up production without the purchase of major factory equipment was principal subject of discussion at a meeting of the American Management Association's Production Division, held May 21 and 22 at the Hotel Astor, N. Y. City.

New Association Heads

C. R. Baldwin was elected president of the American Tung Oil Association recently at the final meeting of the annual convention succeeding J. B. Wight.

Dr. Cary Eggleston has been elected president of the convention by the Board of Trustees of the U. S. Pharmacopeial Convention to succeed the late Dr. Charles W. Edmunds.

New Mathieson Alkali Appointments

George W. Dolan (left) has been elected executive vice-president of Mathieson Alkali Works and J. V. Joyce, comptroller (right), has been elected vice-president and comptroller.

PERSONNEL

W. C. Pinkerton, for the past six years Assistant Technical Editor of Chemical Engineering Catalog, has resigned to join the Monel and Rolled Nickel Advertising Department, International Nickel. A specialist in the handling of technical material for the process industries, he will edit house publications devoted to those industries.

W. H. Face, manager of Monsanto Chemical's Plastics Division branch office at St. Louis, Missouri, has been called to extended active service as first lieutenant of cavalry at Fort Riley, Kansas . . . **R. C. Evans,** formerly Vuepak representative in the Chicago area, has assumed duties at St. Louis as plastics division branch manager . . . **O. S. McDowell,** North Coast Chemical & Soap Works executive, is now at the air base quartermaster corps, Pendleton Ore., with the rank of captain.

George T. Kilmon has been elected assistant secretary, and **Edward M. Martin** assistant treasurer of the B. F. Goodrich Co. by the board of directors. . . . **Harry Tankoos, Jr.,** formerly vice-president in charge of advertising of the U. S. Plastics Craft Corp. has been appointed advertising manager of M. J. Merkin Paint Co., Inc. . . . **R. C. Adams** has been added to the staff of W. H. Bixby, Inc., Des Moines, as a sales engineer . . . **Stephen B. Haynes** has been elected assistant treasurer of the Cochrane Corp., Philadelphia.

Norman L. Deuble, formerly assistant to vice-president, Copperweld Steel Co., Warren, O. has been appointed manager of sales . . . **D. A. Kalton** and **A. W. Thomas** have been appointed assistants to the sales manager of the Construction Equipment Division, Chain Belt Co., Milwaukee . . . **Ray J. Wilkins** recently was named Sacramento distributor of Premier Paint Products, Los Angeles.

Charles P. Gulick, president and chairman of the board of National Oil Products Co., Harrison, N. J., has been appointed assistant to the State Advisor on Occupational Deferments under the Selective Service Act by Governor Edison, of New Jersey . . . **Dr. Donald Price,** Technical Director of the Organic Research Laboratory of National Oil Products, has been elected chairman of the New York Chapter of the American Institute of Chemists for 1941-42. He succeeds **Dr. William Howlett Gardener,** of Brooklyn Polytech . . . **Perc S. Brown,** vice-president in charge of the Vitamin Divisions of National Oil Products, announces the appointment of **Dr. Harold Urist** to the research staff.

Dr. H. I. Cramer, Professor of Rubber Chemistry at the University of Akron, has resigned from that position and on or about August 1st will join the Research and Development Department of Sharples Chemicals Inc., Philadelphia. **F. S. Hambly,** president of the Electric Reduction Co., Buckingham, Ont., was elected chairman of the Ottawa Branch, Canadian Institute of Chemistry, recently . . . **George Weiss,** 20-year-old graduate of Brooklyn College who receives his degree June 23 is the winner of the annual award offered by the American Institute of Chemists to the outstanding student of chemistry at the college.

New committee for conservation of strategic materials of Allegheny Ludlum Steel Corp., Pittsburgh, includes: **V. B. Browne,** vice-president in charge of research; **C. A. Scharschu,** director of research & metallurgy; **R. P. deVries** and **W. R. Breeler,** associate directors of research.

James H. Maguire has retired from active duty as works manager of Haynes Stellite Co., Kokomo, Ind., a unit of Union Carbide & Carbon . . . **F. T. McCurdy** becomes general superintendent in charge of production and operating departments . . . **J. R. Brown,** formerly production manager, will be assistant superintendent . . . **H. C. Fretz,** as

assistant to the superintendent, will be in charge of foundries.

Dr. Edward A. Doisy, St. Louis University School of Medicine, received the 1941 Willard Gibbs Medal of the Chicago Section, American Chemical Society, one of the highest honors bestowed in chemistry, last month at a national gathering of scientists in the Stevens Hotel, Chicago . . . **Dr. Arthur W. Burwell,** technical director of Alox Corp., Niagara Falls, N. Y., has been awarded the Jacob F. Schoellkopf Gold Medal of the Western New York Section of the American Chemical Society.

J. M. Howell, executive assistant to **E. D. Spicer,** manager of the Schenectady Works, General Electric, has been named to succeed his chief who has been advanced to the post of assistant to the vice-president in charge of manufacturing . . . **Keith Sime** has been named Northwest representative for Chipman Chemical Co., Bound Brook, N. J., succeeding **I. W. Bales** who has been named director of research at the company's laboratories.

Dr. Horace W. Gillett, nationally-known authority on metals, recently addressed the American Society for Refrigerating Engineers at their national convention in Cincinnati, on "Substitutes for Scarce Metals."

L. J. Lynch has been appointed representative for Morris Machine Works, Baldwinsville, N. Y., manufacturers of centrifugal pumps, hydraulic dredges and steam engines, in the Detroit district. He is located at 403 Kales Building.

Dr. Joseph DuBose Clark has been appointed Chemical Director of Glyco Products Co., Inc., Brooklyn, N. Y., where he will be in charge of research and development.

B. L. Landers, New England manager of the chemical department of Philipp Brothers, Inc., has been made vice-president in charge of the New England division. . . . **William G. McLeod,** Madison, Wis., was elected president of the American Oil Chemists Society at the 32d annual meeting of the group last month in New Orleans.

Fred S. Fallek, formerly managing director of Falco Products, Ltd., Antwerp, has formed the firm Fallek Products Co., 149 Broadway, N. Y. City. New company will serve long-established overseas connections in the field of chemicals, drugs, solvents, metals and ores. Telephone number is Worth 2-3961.

Owens-Illinois Promotions

Promotions in top management positions of Owens-Illinois Glass and Owens-Illinois Can were announced recently by **J. Preston Levis,** president . . . **Randolph H. Barnard,** executive vice-president and **Faustin J. Solon,** vice-president, will in the future devote their entire time to general management, production and sales problems . . . **Garland Lufkin,** general manager of the closure and plastics division, is now general manager of the glass container division . . . **Smith L. Rairdon,** formerly vice-president and general sales manager of Owens-Illinois-Can will succeed Mr. Solon as general sales manager of the glass container division . . . **Stanley J. McGiveran,** general manager of the Insulux products division, will succeed Mr. Rairdon as vice-president and general sales manager of Owens-Illinois Can . . . **Ray R. Washing,** plant manager, Glassboro, N. J., will take over the position of general manager of the Closure and Plastics Division, Toledo . . . **Hugh Paul,** former sales manager of the Insulux products division will become manager of that division and his position as sales manager of the division will be taken over by **Edward P. Lockart,** manager of the architectural department.

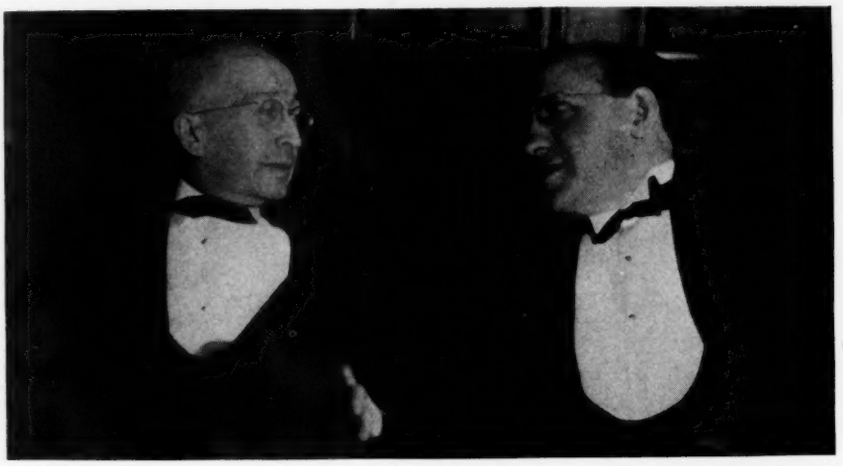
Conway at AFA Convention

Carle C. Conway, chairman of the board of Continental Can, participated in the 37th Annual Convention and Advertising Exposition of the American Federation of Advertising, at the Hotel Statler in Boston, May 26.

Baeza Giving Course

Dr. Walter J. Baeza, Industrial Research Co., is giving a national defense course in powder metallurgy at City College of New York starting June 23.

Dr. Silverman and Dr. Work Discuss Glass



Dr. Alexander Silverman, head of the department of chemistry, University of Pittsburgh (left), spoke before a joint meeting of the American Section of the Society of Chemical Industry and the American Institute of Chemical Engineers at the Chemists' Club, N. Y. City, recently. Dr. Lincoln T. Work (right), chairman, presided. Pictured above after his lecture on "Glass: Today and Tomorrow," Dr. Silverman clears up a question for Dr. Work.

OBITUARIES

William P. Allen

William P. Allen, 59, formerly vice-president and general manager of the paint, lacquer and chemical department of du Pont, Wilmington, died May 17.

J. L. McKnight

J. L. McKnight, assistant secretary of B. F. Goodrich and head of the firm's legal department died May 15 at his home near Akron, O. He was 55.

Dr. E. C. Clemmensen

Dr. Erik C. Clemmensen, 65, president of the Clemmensen Chemical Corp., Newark, died May 19 of a heart attack. He was one of the founders of the Commonwealth Chemical Corp.

Dr. Gilbert H. Boggs, Sr.

Dr. Gilbert H. Boggs, Sr., director of the Department of Chemistry and Chemical Engineering at Georgia Tech., died May 14 at the age of 65.

Dr. Arthur C. Langmuir

Dr. Arthur Comings Langmuir, research chemist and world authority on shellac and glycerine, died May 14 of a heart attack at his home in Hastings-on-Hudson, N. Y. He was 69 years old and a brother of Dr. Irving Langmuir who won the Nobel Prize for chemistry in 1932.

Dr. Albert N. Benedict

Dr. Albert Newell Benedict, president of the Arlington Chemical Co., N. Y. City, died June 2 of a heart attack in his office. He was 57 years old.

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U.S.I. CHEMICAL NEWS

June ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1941

Describes Emulsion For Matte Finishes On Coated Fabrics

Novel Process Utilizes Ethyl Acetate, Cellulose Derivative

NEWBURGH, N. Y.—Dull finishes, free from a tendency to "crock," can be produced on coated fabrics by means of an emulsion of water and a cellulose derivative solution, it is claimed in a patent granted to an inventor here. Such dull finishes, it is pointed out, are particularly useful in the manufacture of fabricated leather, where very bright finishes are sometimes undesirable.

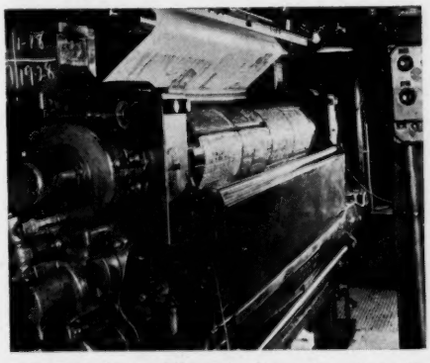
In a typical procedure outlined in the patent, a fabric is first coated with a composition of cellulose nitrate, ethyl alcohol, ethyl ace-

(*Continued on next page*)

Zein Solutions Suggested As Printing Ink Vehicles

MERIDEN, Conn.—Printing inks that dry rapidly to form a tough, non-smudging, adherent coating may be formulated with the aid of zein, it is claimed in a patent granted to an inventor here.

The zein may be dissolved either in a direct solvent or in a mixture of direct solvent and



Inks that dry rapidly and adhere strongly to the paper can be formulated with zein.

non-solvent, it is said. The patent lists ethanol, ethylene glycol, and ethyl lactate among suitable solvents, while the non-solvent may be acetone, ethyl acetate, ethyl phthalate, butyl phthalate, butanol, or amyl alcohol.

It is claimed that inks formulated with these zein vehicles work easily on printing presses, and are adaptable to printing not only on paper, but also on cloth, glass, metal, and wood.

Solox Demand on Up Trend

Solox, U.S.I.'s alcohol-type solvent, which has established itself in a wide variety of applications because of its excellent solvent powers and low cost, is now being used still more extensively in the current shortage of isopropanol. Industry is also showing increased interest in the various formulas of S.D. Alcohol, and a number of manufacturers who had substituted isopropanol for ethanol in their formulations are now reverting to ethanol.

New Applications in Synthesis Seen for Ethyl Chloroformate

Reactivity of U.S.I. Product Indicates Wide Potentialities In the Manufacture of a Broad Range of Organic Chemicals

Constantly broadening fields of utility for ethyl chloroformate (ethyl chlorocarbonate) are resulting from the further study of the reactions of this unusual compound. Although ethyl chloroformate has been manufactured by U.S.I. on a commercial scale for a number of years, many new applications have been recently uncovered, and it is probable that continued research will point the way to still broader potentialities.

A second factor contributing to the wider utility of ethyl chloroformate is the development by U.S.I. of improved manufacturing equipment and processing control which have permitted reductions in the price of this compound in the last few years.

Ethyl chloroformate is made by reacting carbon monoxide with gaseous chlorine to produce phosgene, which is then reacted with anhydrous ethanol, splitting off hydrochloric acid and yielding ethyl chloroformate. Because of the corrosive nature of the main raw materials, special equipment is necessary in manufacturing.

Major Applications

Among the outstanding applications of ethyl chloroformate are the production of flotation agents for ore refining and the preparation of ethyl carbonate (diethyl carbonate). Ethyl carbonate, produced by an exclusive process developed by U.S.I., is a neutral solvent used in special-purpose lacquers. Another interesting use of ethyl chloroformate is in the preparation of crystal violet.

Many other potentialities of ethyl chloroformate offer fertile fields for investigation. Some of the reactions of ethyl chloroformate are as follows:

1. With ammonia, it gives urethan; with hydroxylamine it gives N-hydroxy-urethan; with hydrazine hydrate it gives ethyl bicarbamate; with urethan or sodium urethan it gives ethyl imidodicarboxylate; with ethyl imidodicarboxylate it gives ethyl N-carbethoxy-imidodicarboxylate; with urea it gives ethyl allophanate and cyanuric acid; with guanidine it gives ethyl guanidine dicarboxylate; with sodium cyanamide or with cyanamide in

(*Continued on next page*)

U.S.I. Product Used as Tartrazine Intermediate

Ethyl sodium oxalacetate, an unusual chemical developed by U.S.I., is being used in increasing quantities for the manufacture of dyestuffs of the Tartrazine type. Ethyl sodium oxalacetate is suitable for many other uses, and possesses the special advantage of high stability. The pure oxalacetic ester is relatively unstable, but the sodium derivative is stable.

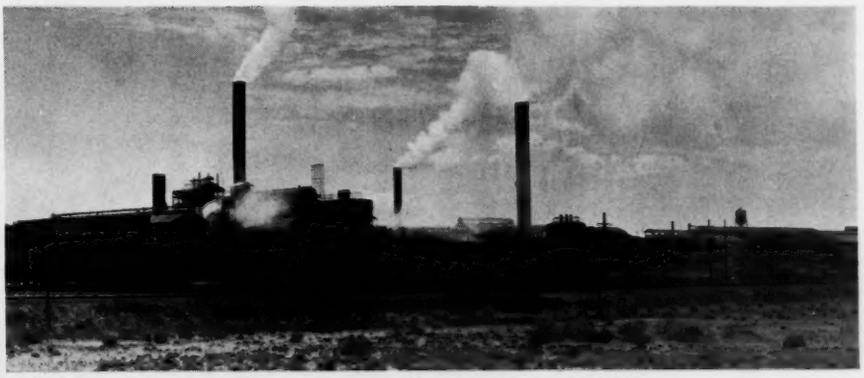
Unusual Flax By-Product Has Wide Potentialities

PISGAH FOREST, N. C.—Possibility of wide industrial utility is seen for flax shive, a by-product of the stalks of American flax, U.S.I. Chemical News has learned. The other component of the flax stalks, the bast fiber, is currently being used commercially with a high degree of success in the manufacture of American cigarette paper, but it is believed that the full potentialities of the flax shive have not yet been utilized.

Described as consisting largely of cellulose (53.78%) and pentosans (19.9%), the flax shive is regarded as a potential source of alpha cellulose, chlorophyll, pectin, xylose, and other materials.

Suggested commercial uses for the flax shive, in natural or processed form, are in plastics, activated carbon, paper, wall boards, fillers, insulation, packing material, fuel.

U.S.I. will be glad to refer readers to a source of further information on the possibilities of flax shive, which we are informed is available in large quantities and at low costs.



Ore refining makes extensive use of flotation agents, many of which employ ethyl chloroformate as an intermediate. Many other forms of synthesis are possible with this compound.

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June ★ **U.S.I. CHEMICAL NEWS** ★ 1941

Laboratory Simulates Cold of Stratosphere

CHICAGO, Ill.—The low pressures and temperatures of the stratosphere are being duplicated in the laboratory in an apparatus designed for training weather observers and in calibrating balloon recording instruments, it has been reported here.

Temperatures as low as —100° F. are being produced in the apparatus by means of a combination of alcohol and solid carbon dioxide, it is said.

Solid carbon dioxide ("DRY-ICE") is manufactured and distributed by Pure Carbonic, Incorporated, an associated company of U.S.I.

Dull-Coated Fabrics

(*Continued from previous page*)

tate, pigment, and plasticizer, which produces a bright finish. After several coats of this composition, the fabric is prepared for the emulsion by a coating of cellulose nitrate, ethyl alcohol, and ethyl acetate.

The final coat, which produces the dull finish, is an emulsion consisting of:

	Parts by weight
Cellulose nitrate	9.10
Water	13.64
Benzene	40.86
Plasticizer	9.10
Ethyl acetate	27.30

Other cellulose derivatives may also be used, it is said. For example, a matte finish emulsion using ethyl cellulose may be prepared with the following proportions:

	Parts by weight
Ethyl cellulose	8.81
Water	17.64
Plasticizer	7.35
Ethyl acetate	66.20

Suitable plasticizers include butyl phthalate and castor oil. The process, according to the inventor, is not limited to fabrics, and may be applied also on wood, metal, glass, and other products.

Discovers Ether Increases Toxic Effect of Fumigants

AMES, Iowa—That ether increases the toxicity of certain fumigants to the confused flour beetle is indicated by the results of experiments recently reported here.

Ether acts as a synergist with both carbon disulphide and carbon tetrachloride, according to the tests, increasing the toxic effect of these fumigants in all ether concentrations studied.

Ethyl Chloroformate In Organic Synthesis

(*Continued from previous page*)

concentrated caustic soda solution it gives ethyl cyanamidedicarboxylate.

2. It condenses with metallic sodium and ethyl iodide to give ethyl secondary-butyl ketone and other products.

3. It reacts with phenyl magnesium bromide to give ethyl benzoate and triphenylcarbinol; with ethyl magnesium bromide it gives triethylcarbinol; with alkyl magnesium bromides it also gives ethyl alkylcarboxylates.

4. With allyl iodide in the presence of zinc, it gives among other things triallylcarbinol.

5. With metal compounds of alkylacetylenes it gives ethyl alkylacetylenecarboxylates.

6. With alcohols or alcoholates it gives neutral alkyl carbonates—either mixed ethyl carbonates, or di-substituted alkyl carbonates; with quinine there results quinine ethyl carbonate.

7. With phenol it gives ethyl phenyl carbonate and ethyl salicylate.

8. With sodium sulphide there results dicarbethoxy sulphide; with sodium ethanethiol there results ethyl thiolcarbonate.

9. With ethyl sodium malonate it gives ethyl methanetricarboxylate; with ethyl sodium methanetricarboxylate it gives ethyl methanetetracarboxylate. With ethyl sodium acetoacetate there results much O- and a little C-ethyl carbethoxyacetoacetate; with ethyl sodium cyanoacetate it gives ethyl cyanomalonate; with sodium benzoate it gives ethyl benzoate and benzoic anhydride; with sodium ethylene glycol it gives diethyl ethylene dicarbonate, from which ethylene carbonate can be obtained; with potassium cyanate there results carbethoxy isocyanate, and, depending on the conditions, the tricarbethoxy derivative of isocyanuric acid, and also the triethyl, the diethyl carbethoxy, and the ethyl dicarbethoxy derivatives of isocyanuric acid.

10. It reacts with benzene in the presence of aluminum chloride to give ethylbenzene.

11. With bromobenzene and sodium amalgam it reacts to give ethyl benzoate.

12. With acetone and potassium cyanide there results O-carbethoxy-alpha-hydroxyisobutyronitrile.

13. With phenol carboxylic acids and alkali there result carbethoxy derivatives.

(U.S.I. will gladly give additional information on ethyl chloroformate.)

TECHNICAL DEVELOPMENTS

Further information on these items may be obtained by writing to U.S.I.

A new phenolic resin is described as especially suitable for formulating varnishes containing dehydrated castor, linseed, and treated fish or soybean oils as replacements for tung. According to the maker, the resin kettles easily, has good solubility, and promotes rapid bodying and hardness. **(No. 460)**

U S I

A new inert is reported to permit lower cost and better stability in paint formulation. It is said to have special advantages in lithopone, titanated lithopone, and titanated calcium sulphate formulations. It may also be employed as a white reinforcing filler in rubber compounding. **(No. 461)**

U S I

A blackening process for zinc and its alloys is reported to produce an adherent, jet-black finish in from 1 to 5 minutes. Process consists in immersing the metal parts in a hot water solution of the blackening salts. **(No. 462)**

U S I

A concrete treatment is said to clean, preserve, and color at low cost, without special equipment. Maker claims that the floor surface can be used within 15 to 30 minutes after treatment. **(No. 463)**

U S I

New inks for glass are described as non-corrosive, non-toxic, resistant to the action of many acids, including hot sulphuric, nitric, and hydrochloric, as well as to many organic solvents. **(No. 464)**

U S I

A metal deactivator increases the storage stability of petroleum distillates, according to the maker. Product is described as a liquid which forms stable complex compounds with various metals, reducing the ionization and catalytic activity of the metallic ions. **(No. 465)**

U S I

A glossmeter is said to be designed for testing samples for compliance with specifications for original gloss, and for measuring changes in gloss caused by weathering, wear, and abrasion. **(No. 466)**

U S I

A new anti-skinning agent is described as colorless and odorless. Maker says that it volatilizes almost immediately on application of the film, so that it does not affect drying time adversely. **(No. 467)**

U S I

A luminous compound is described as a liquid plastic rather than a paint. It is said that with proper activation the afterglow will last throughout an entire night. **(No. 468)**

U S I

Colloidal iron oxide is a new red pigment that is reported to be suitable for use in rubber compounding, paints, inks, and plastics. According to the maker, its behavior in rubber compounds resembles that of colloidal carbon. **(No. 469)**

U.S.I. INDUSTRIAL CHEMICALS, INC.

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Completely Denatured—all regular and anhydrous formulas
Pure—190 proof, C.P. 96%, Absolute
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Amyl Acetate
Butyl Acetate
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PROPIONIC ESTERS
Amyl Propionate
Butyl Propionate

OTHER ESTERS
*Diatol
Ethyl Carbonate
Ethyl Chloroformate
Ethyl Formate
Ethyl Lactate

INTERMEDIATES
Acetoacetanilide
Acetoacet-ortho-anisidide
Acetoacet-ortho-chloranilide
Acetoacet-ortho-toluidide
Acetoacet-para-chloranilide
Ethyl Acetoacetate
Ethyl Benzoylacetate
Ethyl Sodium Oxalacetate

ETHERS
Ethyl Ether
Ethyl Ether Absolute—A.C.S.

OTHER PRODUCTS
Acetone
*BK-5
Collodions
*Curbay B-G
*Curbay Binders
*Curbay X (Powder)
Derex
Ethylene
Ethylene Glycol
*Indalone
Methyl Acetone
Nitrocellulose Solutions
Potash, Agricultural
Urethan
*Vacatone

COMPANIES

Synthetic Ammonia

Production of synthetic ammonia for the manufacture of explosives soon will be under way in a new, modern "black-out" plant at Wilson dam, near Sheffield, Ala. Koppers Co. Bartlett Hayward division has been awarded a contract by the Tennessee Valley Authority for the construction of one of its semi-water gas plants and auxiliary equipment. Construction will be started as soon as possible and the plant is to be ready for operation 90 days later.

Buys Pumice Mill

Barnsdall Oil Co., through its subsidiary, Barnsdall Tripoli Co., has sold to the McAleer Manufacturing Co., Detroit, and Whittaker, Clark & Daniels, Inc., manufacturers of minerals, colors and pigments, N. Y. City, its pumice mill at Grants, N. Mex., and has leased to them a large pumice deposit. New company will be known as Pumice Corp. of America. Entire operating staff and policies of the company will remain unchanged.

Carbonyl Iron Production

General Aniline Works is now producing Carbonyl Iron Powder at its works in Grasselli, N. J. Iron powders which are being produced in the new plant, the first of its kind in the United States, are destined principally for use in electrical devices. Grades of G. A. W. Carbonyl Iron Powder for other applications in the field of powdered metallurgy will also be available.

Selling agent is Advance Solvents & Chemical Corp., N. Y. City.

Potash Chlorate Production

Western Electrochemical Co., Los Angeles, has announced that production of potash chlorate from its facilities will start July 1.

Goodrich Improvements

B. F. Goodrich Company, Akron, recently announced improvements in its high pressure butane-propane hose. Because of the demands of utmost flexibility in a hose used in this service, the new Goodrich product uses two hawser cord braids with a fabric backing over the tube. This backing greatly increases resistance to diffusion. New compounds developed for the hose show practically no decreases in flexibility through temperature ranges of 20 below zero to 75 above. Flexibility has been increased from three to five times with working pressures remaining the same, 300 pounds.

Cobalt Production

Cobalt metal, cobalt oxide and other cobalt derivatives are now being produced in a new $600,000 Niagara Falls plant of the Electric Metallurgical Sales Co., unit of Union Carbide & Carbon. Central Trading Corp., N. Y. City will distribute the products. Output is expected to be 900,000 tons yearly.

Western Adhesives Sold

Murray Stempel, vice-president and general manager of Paisley Products, Inc., Chicago, announced last month that his firm has purchased the equipment, formulas, and manufacturing processes of Western Adhesives Co. Manufacturing will be transferred to the Paisley plant, which is now undergoing extensive alterations and expansion of storage, laboratory and manufacturing facilities.

Carbon Black Storage

Two large bulk storage tanks were recently completed and added to the facilities of the Sunray, Tex., plant of Continental Carbon putting bulk storage capacity now well in excess of 2,000,000 pounds of dustless carbon black. Both cylindrical tanks were specially constructed to handle either the package or the bulk form.

Salt Cake Refinery

Operations were begun early this month at the Washington Chemical Co. refining plant at Monse, Wash. Saltcake from lakes near Monse is to be refined into anhydrous sodium sulfate and supplied to paper mills in the region.

Lubitz Takes Over

Allan A. Lubitz, president, American Firstoline Corp., Long Island City, has taken over the general sales management for domestic and export markets of Gulton Metal Refining & Chemical Corp., manufacturers of non-ferrous metals.

Triple Warehouse Space

Warehouse facilities of the Thompson-Hayward Chemical Co., at New Orleans have been tripled by the purchase of two adjoining buildings.

Safety Awards

Safety awards for the best records in 1940 were presented recently to departments of Abbott Laboratories. James F. Stiles, Jr., vice-president and treasurer, made the awards.

On 24-Hour Basis

Tungsten-Tin concentration plant, a unit of the chemical division of Foote Mineral, Philadelphia, is operating on a 24-hour basis, seven days a week. Dust collection equipment, larger dryer and bucket elevator have been installed.

New Chemical Company

Formation of a new company for the sale and distribution of industrial chemicals, dyestuffs and fertilizer materials with offices at 156 Withers st., Brooklyn, N. Y., has been announced. Arthur C. Johann is president of firm which will be known as Johann Chemical Corp.

Vacuum Desiccation

Sole rights for licensing under their patents for vacuum desiccation from the frozen state have been granted by Sharp & Dohme and F. J. Stokes Machine, Philadelphia, to a new Pennsylvania corporation, Lyophile-Cryochem Company. Commercial application of this process was developed by scientists of the U. of P., Stokes engineers and research staff of Sharp & Dohme.

In the process, moisture is removed under high vacuum from rapidly frozen preparations so that only the dry substance remains in the final market container which is sealed under vacuum. It is restored to the fluid state by the addition of distilled water.

Licenses under this process already have been granted to several manufacturers, it was stated. Lyophile-Cryochem will grant further licenses under the patents covering the lyophile, cryochem and desivac arrangements of the vacuum desiccation process and other modifications covered by patents in this field.

In New Locations

W. H. & L. D. Betz, chemical engineers and consultants, announce the removal of their general offices and laboratories to Gillingham and Worth sts., Philadelphia. New property affords an overall increase of 400 per cent in floor space, with research and analytical laboratories occupying seven times as much space, and general offices and consulting room increased to four times the former area.

Coleman Electric Co., Maywood, Ill., has opened a sales and service office at 122 East 42d st., N. Y. City. D. A. Korman, formerly sales manager of Eimer & Amend, is in charge. Company manufactures pH equipment and similar products.

International Agricultural Corp. is moving its general offices from New York to Chicago about July 1. The firm has leased the 29th floor of the Civic Opera Building, on Wacker Drive.

Research Laboratories Inc., formerly 126-128 West 32d st., N. Y. City, has moved its laboratories and business office

to larger and more modern headquarters at 114 East 32d st.

Industrial & Engineering Chemistry and the *News Edition* have moved offices from 706 Mills Bldg. to 1155 Sixteenth st., N. W., Washington, D. C.

Herman Meyer Drug Co., Inc., has moved its offices, laboratories and factory to 66-38 Clinton ave., Maspeth, N. Y. Company expects to enlarge manufacturing facilities on specific chemicals and pharmaceuticals which heretofore came from Europe.

H. J. Baker & Bro., fertilizers, N. Y. City, moved its Chicago office recently to 208 South La Salle st. Telephone Central 4355-6.

King Paste & Glue Co. now is located at 230 West Superior st., Chicago.

L. Kruger & Co. has moved offices to 75 West st., N. Y. City. New telephone number is Bowling Green 9-1887-1888.

Allis-Chalmers Mfg. Co.'s Toledo district office, of which W. R. Mengel is manager, is now located in the Toledo Trust Building.

CONSTRUCTION

New Koroseal Plant

Plans for the immediate construction near Louisville, Ky., of a large manufacturing plant which will quadruple the production of koroseal, the synthetic thermoplastic material of the B. F. Goodrich Co., were announced last month by John L. Collyer, president. The new plant has been given a preference rating for construction materials and machinery by OPM and it is expected to be completed and in operation within six to eight months.

Thiocyanate Production

Large-scale production of ammonium thiocyanate is planned at the Everett, Mass., plant of Eastern Gas & Fuel Associates. New plant produces both crystals and 30 per cent liquor. Marketing will be done by the Tar & Chemical Division, Koppers Co., Pittsburgh.

New Rumford Lab

Rumford Chemical Works recently completed the first part of its new research laboratory. New building will ultimately house existing research facilities and specific items of pilot plant equipment.

Foote Constructing

Foote Mineral Co., Phila., is adding 8,200 square feet to its chemical plant and is planning to transfer to this building manufacture of strontium products. Also under construction is a combined factory office and warehouse at the Wyndmoor plant.

Wannamaker Rebuilds

Wannamaker Chemical Co., Orangeburg, S. C., is rebuilding its plant, recently the scene of an explosion causing a loss of $50,000. Enlargement of production is planned and it is hoped that operations from the new plant will begin sometime during the summer.

Aniline Constructing

Nearly $1,000,000 will be spent by National Aniline & Chemical Co. to house additional chemical equipment at its Buffalo plant. Purpose of the new construction has not, as yet, been revealed.

Tubize Expansion

Huge expansion of Tubize Chatillon's Rome, Ga., plant and improvements at the Hopewell, Va., plant were contemplated recently as a result of stockholders' approval of a $4,500,000 loan. It is understood that the Rome project will involve an outlay of approximately $2,000,000 which will make it the largest construction project in this section since the last big expansion of the Georgia rayon plant.

Durez Additions

Additions which will include a small building and a tank structure at a cost of $9,000 will soon be made to the plant of Durez Plastics & Chemicals, Inc., No. Tonowanda, N. Y.

Synthetic Rubber

Standard Oil Co. of Louisiana announced this month that it would begin construction on a large synthetic rubber and chemical project at its refinery in Baton Rouge. New project is to involve the expenditure of $12,000,000 to $15,000,000 in the next 15 months

Western Constructing

Western Chemical Co., Washington, Mo., recently began construction of a two-story addition to its plant which manufactures boiler compounds and other chemical products.

Manganese Ore Reduction

Planning construction of a large manganese ore reduction plant at Lake Valley, New Mexico, Newalpitt Corporation, Albuquerque, has ordered necessary machinery, according to Rufus C. Little, general superintendent. The proposed plant will cost approximately $300,000.

A government contract for 160,000 tons of concentrates at a price of $5,000,000 has been given the company, he said.

Bolivian Ore Smelter

A government-owned-and-operated tin smelter for domestic production of Bolivian ores is to be built on the ship channel at Texas City, Tex. Choice of this location hinged upon the presence of cheap fuel, raw materials and good transportation.

The smelter will be constructed by Tin Processing Corp., N. Y. subsidiary of N. V. Billiton Maatschappij, Dutch East Indies, with a capacity of 50,000 tons concentrates or 18,000 tons of fine tin.

Buy More Land

Hoffman La Roche, Inc., Nutley, N. J., chemical manufacturers, have acquired property for a contemplated expansion program to begin shortly.

Harshaw Expanding

Harshaw Chemical Co., Cleveland, is spending nearly $200,000 for new constructions to be finished by Fall which will increase production about 10 per cent.

New Barite Plant

A $225,000 air-conditioned barite plant to be constructed of cement and steel at the Magnet Cove area of Hot Spring county, Little Rock, Ark., has been announced by the Baroid Sales Division of National Lead Company.

It was also announced that the Magnet Cove Barium Corporation which operates a barite plant at Malvern is planning to double capacity of its plant. This plant started operations last June and has an output of 65 tons daily.

Explosion-Proof Plant

A $50,000 "explosion-proof" factory at its Piel Brothers division, Indianapolis, is to be constructed by National Starch Products, Inc., for the manufacture of dextrine, it was announced recently. Extensive use of glass, which would give way in the event of spontaneous combustion in the fine flour dust, will be used in the 3-story plant.

Double Production

Substantially increased demand for "Pioneer" brand asphalt products from the new Chicago refinery of Wishnick-Tumpeer, Inc., has necessitated doubling production potential with the installation of additional still capacity, tripling storage capacity and increasing facilities by 50% with a second drum-filling unit, it has been announced.

New Shell Plant

Shell Oil recently awarded a contract for the construction of a plant at its Houston, Texas refinery for the manufacture of butadiene, basic ingredient of one form of synthetic rubber. Scheduled for operation this summer, the plant will have an annual capacity in excess of 5,000 tons.

Markets in Review

Heavy Chemicals — Fine Chemicals — Coal Tar Chemicals — Raw Materials — Agricultural Chemicals — Pigments and Solvents

By Paul B. Slawter, Jr., Market Editor

THE President pulled up a fireside last month and had a much-heralded chat with you and me and everybody. In proclaiming the unlimited emergency it looked at the moment like we were getting down to some serious business. Next day, however, in a special clarifying press conference the President modified some of his statements. let it be known that he was not planning any direct steps then to implement his anti-strike declaration and made it clear that he had no further ideas as to speeding up or coordinating the defense organization, which, confidentially, is a little muddled and confused. There was no request of Congress to repeal or modify the Neutrality Act. He also said that "freedom of the seas" does not mean that American ships shall be allowed to go where they might be sunk. This reporter, although of cannon fodder age, was disappointed. So were my paper boy, conductor and milkman who all said something tantamount to "why don't he do something?" Of the American defense effort a Chinese paper said, "Big noise on stairsteps, nobody comes down."

Strikes continue to be the most important and most shocking news reported. A rough count early this month revealed 34 strikes—work stoppages—that are curtailing production on War Department contracts; there are 40 strikes that are holding up Navy Department contracts; there are about 20 other strikes—including one in the aluminum industry—that have been threatened by labor leaders in different sections of the country. Strikes to date have deprived us of enough man-hours to have produced 8 to 10 submarines, 6 to 8 destroyers, or two battle cruisers. The American Potash strike in its 12th week was looking hopefully to negotiations in Washington to bring about some settlement. Soft coal strikes, according to Labor Secretary Perkins, caused strikes in April to involve more than four times as many workers as in March and more than five times the days lost. A showdown, it is felt, may be near between recalcitrant labor and President Roosevelt's efforts to halt work stoppages.

Look for new and sharper rationing of essential imported and domestic raw materials which must be diverted from peacetime industries to arms production . . . Setting of electric power priorities in the southeast TVA area . . . Extension of barter system after the war . . . Steel mills production to hold at capacity levels . . . Henderson's regulation of prices to take labor costs into account . . . Price ceiling on cocoa . . . Absorption of all idle employable persons . . . Substitutes for substitutes (plastics cannot be expected to do *everything*) . . . Rubber conservation measures . . . Greater cuts in auto production than first announced . . . Still further tightening in chlorine . . . Labor-government showdown on strikes in soft coal industry . . . Gasolineless days on Eastern seaboard . . . Lower radio set production when present supplies of strategic materials are used up . . . Continued activity in government's anti-monopoly drive (food indictments are one good example) . . . Japanese overtures for our friendship (and materials she needs) . . . Modifications of move to give President power to draft private property (powers that be aren't willing to go *that* far, yet) . . . Failure of "Good Neighbor" policy (there's trouble brewing in S. A. for us) . . . Dutch East Indies to say nix to Japan on their monopolizing trade (if we back them up) . . . Wartime peak in exports this summer . . . Spread of powder metallurgy now being used on plane parts to machinery in general . . . More RFC funds to provide additional machine tools, aluminum and synthetic rubber for national defense production . . . Increased paper and glass container sales due to tin priorities . . . Inventory controls on chemicals similar to those on metals (informal controls have been in effect but formal controls by OPM are expected to tighten the system)... More peace offensives by Germany.

Important Price Changes

ADVANCED

	May 31	Apr. 30
Amyl Chloride		
Mixed Tch.	$0.06	$0.0565
l.c.l.	.07	.0665
tks., wks.	.05	.0465
Casein		
Argentine, 30 mesh	.19	.13½
dom. 20-30 mesh	.19½	.15
80-100 mesh	.20½	.15½
Castor Beans		
Long ton	68.00	62.00
Castor Oil		
Sulfonated		
50%	.07½	.06½
75%	.10¼	.09¼
80%	.10½	.09½
Dextrine cwt.		
White	4.30	3.85
Gum	4.60	4.15
Canary	4.35	3.90
Egg Albumen	.95	.72
Egg Yolk	.78	.70
Glycerine		
C. P. dms.	.14½	.12½
Cans	.16½	.15
H. G.	.14	.12
Soap lye	.09	.07½
Gums		
Arabic, amber sorts	0.18¼	.16
Aloes, curacao	.62	.53
Tragacanth		
No. 1	2.90	2.75
No. 2	2.70	2.45
Lead Acetate cwt.		
Broken	12.00	11.00
Granular	12.75	11.75
Crystal	12.00	11.00
Powdered	12.75	11.75
Oils		
Cananga		
Native	6.50	5.75
Rectified	7.25	7.00
Vetiver, Java	7.50	6.00
Potash, Muriate		
50% Unit, ton	.56	.53½
Quicksilver, flask	185.00	180.00
Tin, Anhyd,		
Tetrachloride	.28¼	.27½
Turpentine		
Spirits, gums	.51	.46
l.c.l.	.53	.48
Vanilla, Oleo Resin	25.00	no prices
Waxes		
Carnauba No. 1.	.72	.68
No. 2.	.71	.67
No. 3. N. C..	.64	.60
Chalky	.63	.56
Candelilla	.22	.21
Uricury	.47	.42

REDUCED

Amylnaphthalenes		
Mixed, crude	.14	.15
Ref'd	.16	.17½
Blood		
High Grade, Chicago		
Unit, ton	3.15	3.50
Imported, bags	3.05	3.10

Shortages in chemicals are numerous. Broadly speaking, consumption of chemicals may expand at only a moderate rate over the next few months. It was at a peak in March but declined in April. Scarcity is encountered in some coal tar products, in methanol, certain forms of potash, chlorine, nitric acid and ammonia. The list is growing steadily. Textile, pulp and paper demands are at record highs.

Shipping: Shipping shortages remain an obstacle to the progress of the defense program and a threat to certain non-defense supplies. Stockpiles of critical raw materials have not been built to the extent planned. The Maritime Commission has taken 50 tankers from the Atlantic Seaboard and Gulf Coast lines for the shipping pool. Construction of 123 new merchant ships is under way after Maritime Commission contracts were let recently. Cargo space from the Far East is being used to carry rubber. Full control of all shipping to and from the U. S. and further expansion under the vast shipbuilding program can be expected. Withdrawal of Atlantic and Pacific coastline ships has caused plenty of trouble for chemical shippers. Railroads can't keep up with the business if it expands much further.

Strict rationing of space for commercial cargoes in all foreign trades is the probable result of the widespread commandeering of new large American flag ships. Ships are being withdrawn to serve as transport and naval auxiliaries. Export control is considered an important phase of our "all out" defense effort. Ship cargo priorities legislation, now up before the Senate, is directed primarily

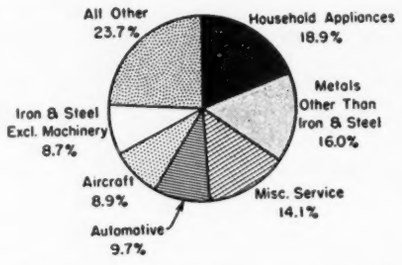
against vessels of foreign registry using American port facilities. War rate insurance rates on ships going to the Red Sea are up. Twenty-one American republics are planning strict control of all exports of war materials. Legislation passed by Congress last month extends the export licensing control system to the Philippines and the Panama Canal Zone. Lead pigments have been added to the list of products exportable under general licenses.

Fear of rail transportation tieups is now becoming an important factor in the buying policies of all industries. The railroad industry is now seeking more equipment to keep abreast of defense program demands. Efforts are under way to keep moving the steady supplies of materials. Lack of steel has slowed up delivery of freight cars and the Association of American Railroads is investigating the use of wood for new freight units to speed up construction.

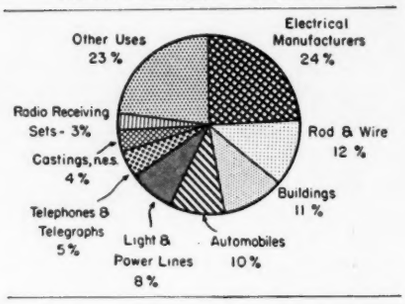
The War of Metals: With the solemn warning from Washington that manufacturers must substitute non-metallic materials for metals wherever possible, Dun & Bradstreet has prepared a report under the foregoing title which gives the situation in a bombshell. Reproduced on these pages are charts showing the normal character of consumption of metals discussed in the article.

Other highlights in metals: Tightening restrictions are ahead all the way down the line. International Nickel at the request of OPM has asked all its wage earners to take a bonus of one-week's vacation pay instead of taking a vacation this year. With copper under priority each manufacturer must set aside every month 20 per cent of his April output. Domestic output of mercury amounted to 3,500 flasks in April. Despite defense officials efforts to conserve all aluminum for aircraft construction it has been revealed that the Army has been ordering thousands of aluminum pots, pans and dishes and 100,000 aluminum pitchers. OPM says that 60,000 coffee pots would make one heavy bomber. (And they talk about taking housewives' pots and pans!) Priorities division has increased the pool requirement for zinc to 22 per cent for June. Nickel scrap was added to the growing list of materials which have a price ceiling.

ALUMINUM
NORMAL CHARACTER OF CONSUMPTION

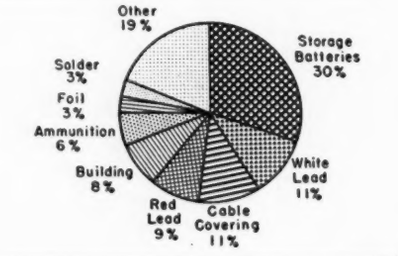


COPPER
NORMAL CHARACTER OF CONSUMPTION

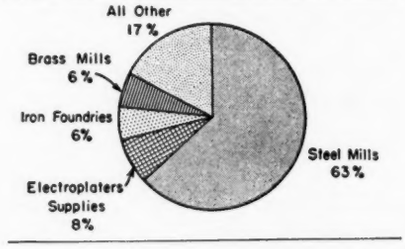


Abnormal demands of all industries operating at peak levels have made for shortages in chlorine (one defense industry is using 150 tons a day), ammonia products, fluorides, barium salts, cobalt oxide, copper sulfate, nickel salts, potassium salts, sodium acetate, sodium chlorate, sodium sulfide and chromic acid. Oxalic acid, also very short, is at a new high price for the year. Bleaching powder prices are up and bichromate prices which have been on a will-it-or-won't-it-basis for a long time have been scheduled for a general price advance by one producer July 1. Soda will go up ½ cent with neutral chromate and bichromate potash up 3/4 cents a pound.

LEAD
NORMAL CHARACTER OF CONSUMPTION

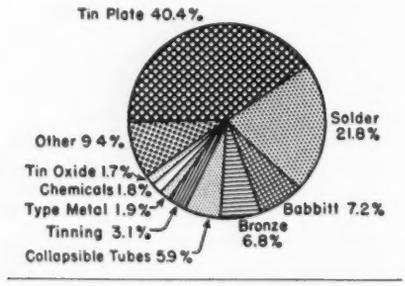


NICKEL
NORMAL CHARACTER OF CONSUMPTION

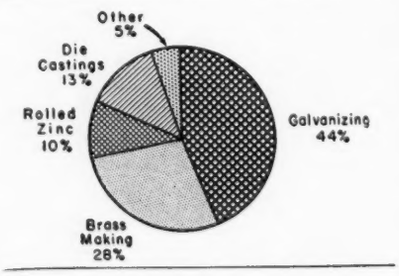


price of standard water-white glacial acetic acid was advanced due to several reasons. The synthetic product is experiencing production difficulties because the raw materials are going to Britain. Diversion of large amounts in the processing of acetate esters and solvents is also a reason. Greater production of soda silicofluoride (by-product of the superphosphate industry which is at peak levels) has been giving encouragement to the industry but it still hasn't offset the dropping of imports from Denmark, Germany, Italy and the Netherlands. Also announced is new production on a commercial scale of ammonium, potassium and sodium thiocyanide, also former imports.

TIN
NORMAL CHARACTER OF CONSUMPTION



ZINC
NORMAL CHARACTER OF CONSUMPTION



First change in a long time on lead acetate prices came about with increasing costs and demands, as in most other instances. Plating chemicals, following the tremendous spurt in building, are in great demand. Buyers from the Far East and South America are actively seeking to buy in the heavy chemical market. Domestic glass operations are above first quarter levels and 1941 will be a record year. Labor troubles are affecting rayon schedules in Eastern manufacturing centers. The paper industry continues to produce at record levels.

On June 6, OPM stated that supplies of borax and boric acid were inadequate for defense needs (ascribing the lack to a protracted CIO strike at American Potash) and imposed full priorities control effective June 9 to give defense needs first call on available supplies. Officials said that the shortage was apparently temporary and that available supplies were sufficient to meet all defense demands. Deliveries under defense orders

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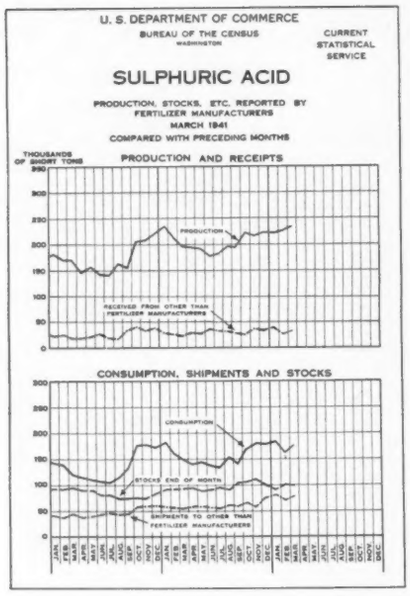

U. S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
WASHINGTON
CURRENT STATISTICAL SERVICE
SULPHURIC ACID
PRODUCTION, STOCKS, ETC. REPORTED BY FERTILIZER MANUFACTURERS
MARCH 1941
COMPARED WITH PRECEDING MONTHS
PRODUCTION AND RECEIPTS
THOUSANDS OF SHORT TONS
PRODUCTION
RECEIVED FROM OTHER THAN FERTILIZER MANUFACTURERS
CONSUMPTION, SHIPMENTS AND STOCKS
CONSUMPTION
STOCKS END OF MONTH
SHIPMENTS TO OTHER THAN FERTILIZER MANUFACTURERS
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

will receive preference rating A-8 and deliveries for manufacture of borosilicate glass will receive a rating of A-9.

As for copper sulfate which is short (see page 784) Phelps Dodge announced last month that it had contracted to purchase new equipment to be used in a revolutionary method of manufacturing copper sulfate and which will go into production as soon as possible.

Fine Chemicals: Rising prices, falling stocks and greying hair are behind the market for fine chemicals this month as has been the case for quite some time and probably will be the case for some time to come. In a word, everything is tight. It might be easier to write this column by naming something that is not.

One of the makers announced early this month price rises and although they may not all be fine chemicals they are listed here to keep them together. Upward went orthodichlorbenzene one cent, tricresyl phosphate three cents, benzyl chloride three cents, monochlorbenzene one cent, trichlorbenzene one cent, and phenol one cent. Organic solvents listed by another company underwent price changes, among them acetone, diacetone, isopropyl alcohol, mesityl oxide, methyl ethyl ketone, methyl isobutyl ketone, butyl alcohols. Another company revised its price schedule on monoamyl, diamyl, mixed polyamyl, mixed crude naphthalenes, and mixed amyl chlorides. Blackstrap molasses was among the up-going prices. Glycerine followed. The inability of producers to accept orders for USP zinc oxide, borax, cadmium, tartartic acid, quinine and formaldehyde has led to higher prices. Brazilian production of castor beans, though good, was disappointing and you may look for the consequences. Methanol prices are entirely nominal. Mercury production, although at higher levels than ever, fails to bring any lower prices with government use on the increase. Citric acid which is going to the soft drink industry in tremendous quantities is being sold on restricted policies. There are ample quantities of the acid, though. Peroxide, with the advent of vacations and increased photography is feeling a greater demand as are all photographic chemicals. There has been no sign of Chinese menthol since February and buyers are looking toward the Japanese for supplies. Tartaric acid buying is not as heavy as it was with citric taking its place and tartar emetic substitutes are finding greater use. Tartar price increases are long overdue. Britain's purchase of glycero-phosphates from us was good for the suppliers but bad for the supplies.

Coal Tar Chemicals: Here again, it's the same old story. Sellers can't handle the volume of orders for tar acids, phthalic anhydride and certain intermediates. An allocation system is being used to assure equitable distribution. Expanding production of phthalic anhydride is expected. No spectacular change in prices to report here, as yet.

By-product production of coke in April was 10.5 per cent below March. Now on the critical priority list are cresols, cresylic acid, naphthalene and phthalic anhydride. Toluol moves steadily into defense production. Phenol prices are up and it is getting harder to obtain. Creosote imports during the first quarter were down; Great Britain and Japan were formerly our greatest sources. A shipment of cresylic acid is expected from England.

In the dyestuff intermediate market, metatoluylenediamine advanced five cents, its first change in some time. This rise in "MTD" is thought to be the forerunner of other upward adjustments in the inter mediate market. April production of benzol was below March. Railroads and public utilities are taking considerable quantities of creosote oil.

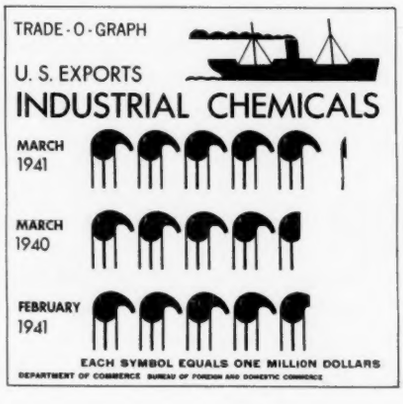
Raw Materials: It's getting harder to ship things here from the Far East so just check off your list of plentifuls any of the Far Eastern raw materials. The uncertain shipping problem has made importers quite unanxious to sell supplies of gum arabic and other such things freely. Carnauba wax, on the rising price list, has been offered by Brazil for July-August shipment. Japanese and Russian buyers are in the Brazilian market buying castor beans. Cork manufacturers have been ordered to cut production in half. There seems to be a growing labor shortage on the southern turpentine farms. The naval stores trade is waiting for definite information as to whether or not the Commodity Credit Corporation will resume deliveries from its turpentine holdings now that the market has approached the 40 cent price level. It is believed that government-held stocks will again be put on the market, if the official Savannah quotation shows further advances. Consumption of 1941-1942 turpentine (gum spirits) can and may show an increase over the year ended March 31.

Coconut oil and hemp prices were reduced last month when the Maritime Commission recommended a drop in recently-increased freight rates (which ship operators in the Philippine trade of the Far East Conference complied with). Buyers from Switzerland, West Indies and the Argentine have been after linseed oil in quantity for export. A new process was introduced recently for extracting the oil from soybeans which will help the paint and varnish industry become further independent of foreign supplies.

Fertilizer Materials: More commercial fertilizer was used by American farmers in 1940 than in any previous year. It seems likely that another increase (of moderate extent, though) will be registered this year. An increase of more than one-half million tons was registered in 1940 over 1939 and already tag sale figures are nine per cent over 1940.

Among the developments in prices were: reinstatement of prices for nitrate of soda and nitrogen solution by one company; manure salts price (25 per cent K_2O Min) 21 cents per unit (min. car lots of 40 tons at seller's plant, New Mexico). The scarcity of ships and prohibitive charter rates have made it unsound to move this low grade commodity to Atlantic ports by water at the present time, the company explained. Muriate of potash (60 per cent) was listed at 53½ cents and the 50 per cent minimum was listed at 58 cents. Leon Henderson in Washington requested producers and distributors of ammonium sulfate to continue formal price quotations now in effect. Also announced was construction of three synthetic nitrogen plants and contemplated increase of by-product nitrogen which will step up the production of nitrogen to 800,000 short tons a year. In 1939 production was 424,000.

Paint Materials: This will be the greatest paint year in history. For the first quarter business was already $20,000,000



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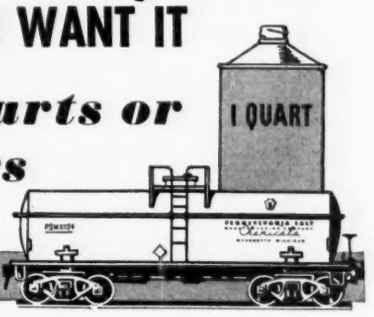

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Corrosion-resistant cements
Ferric chloride
Hydrofluoric acid
Hydrogen peroxide
Kryolith
Kryocide
Mixed acid
Muriatic acid
Nitric acid
Orthosil
Pennpaint
Pennsalt Cleaners (metal)
Pensal
Perchloron
Sal ammoniac
Salt
Salt cake
Sodium aluminate
Sodium hypochlorite
Sulphuric acid

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MANUFACTURING COMPANY
Chemicals
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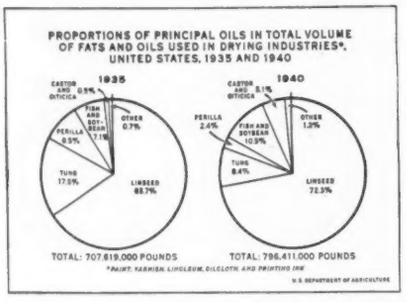
above the first quarter of 1940. Prices have remained pretty stable for the largest housing program ever undertaken and the attendant difficulty in getting raw material supplies. No shellac, for instance, has been shipped to this country for weeks although there is plenty of it in warehouses at Calcutta. There have been no imports of lithopone into this country since 1939 and we are not producing enough of it for normal requirements. Nor are we producing enough zinc sulfide. Supplies of casein are low with domestic production going into dairy products and the Argentine market practically all sold. There will be no production from Argentine for a while and even then there is the cargo situation. The Union of South Africa has taken more paint materials recently than ever before.



Carbon black shipments have been increasing materially and just as a sidelight, April tire output was the highest since 1933. Production of pneumatic casings amounted to 5,812,645 units, which represents a lot of carbon black, among other things. OPM has announced that there will be no shortage in certain natural resins from the Orient. A large supply of tung oil (chinawood) is (1) either awaiting shipment from Rangoon, (2) is on its way, or (3) is practically here at this writing.

Outlook: The outlook is good and bad. There is no reason on earth why this country cannot do everything it is setting out to do in this national defense program. One thing we shall have to learn, and learn it we will if only through catastrophe, the bottlenecks of bureaucracy must be eliminated and we must let industry do the job. Let alone, the technologist has always come through, and as Dr. Cohoe so ably points out in an article elsewhere in this issue, the bungling of incompetent leadership must stop if we are to produce what we are expected to produce. The greatest industrial country in the world will not take long to get in the groove of production if industry is let alone to do the job. Washington could get no better cooperation from industry. Labor will have to learn the hard way, it is feared, and stop the racketeering. The President's interference, though he seemed reluctant to do it, has been felt in the labor situation.

Copper Sulfate

Here's a brief synopsis of what is behind the copper sulfate shortage

Copper sulfate is scarce. Every market man in the business will tell you that. Not every market man, however, can tell you why. This department spent at least three hours on the telephone trying to find out why last month. Finally, a hurried trip around town among the experts gave results with the effect that we're all primed up with information and are ready and willing to give it to you.

Copper sulfate (also known as blue vitriol, blue stone, blue copperas, Roman vitriol, cupric sulfate or Salzburg vitriol) has many uses. Among the classic examples are: textile mordant, leather industry, germicides, insecticides, pigments, electric batteries, electrolytic baths, copper salts, hair dyes, analytical reagent, medicine (astringent, emetic, tonic), improving casein glues, wood preservative, preservation of pulp wood or ground pulp, process engraving and lithography, destroying algae and low forms of animal life in drinking water. The anhydrous form is used as a dehydrating agent.

There are so many new uses for copper sulfate now that there weren't, say five, years ago, that the basic reason for the present shortage of copper sulfate is the fact that production just hasn't kept pace with new uses. There has been a tremendous increase in its use for basic industrial purposes. The petroleum industry, to name one, is taking more and more of the blue stuff for more and more new uses, among which is a new method of cracking and storing petroleum. The banana industry, just to name another, was threatened with extinction a short while ago when a fungus disease (the Sigatoka blight) which seems to have originated in Dutch Guiana started to raise Cain with our bananas After a little research, copper sulfate was found to be the most effective means of controlling Sigatoka and now every banana that comes into this country is under the protection of copper sulfate. Incidentally, this controlling operation requires spraying 11 months and two weeks out of every year. That's a lot of bananas and also a lot of $CuSO_4$.

Copper sulfate also is being sold a lot more to the fertilizer industry than formerly. It has been found that any region where there is a particularly mucky soil—where copper present has been leeched out—the addition of copper sulfate makes things grow where it was otherwise impossible. The Florida Everglades, for instance, never could have been made to grow more than an old stinkweed if it hadn't been for the addition of copper sulfate to the fertilizer. Getting back to bananas, for some peculiar reason, the addition of copper sulfate to the fertilizer in the banana-growing regions makes the bananas grow bigger. And while we're on the agricultural phase, it seems to work out that the older a country gets agriculturally, the greater its tendency is to be troubled with fungus diseases. This country is finding that tendency to be true. This calls for more copper sulfate in the treatment and control of these diseases. Italy, one of the oldest agricultural countries, probably consumes (in normal times) more copper sulfate for this purpose than any other country.

Another reason for the increased use is in the changing of certain plating schedules. One process which formerly called for 30 per cent copper and 70 per cent nickel has been reversed and is now using 70 per cent copper. Municipalities which formerly resorted to sporadic use of the salt in controlling algae now are using it all year round. It also is finding increased use in mining in a differential flotation process. There has been an increased demand for coppered wire and the salt also has found uses in certain manufactured novelties.

The production of copper sulfate is an interesting story and in a way, a peculiar one. Its most practical means of production is as a by-product in copper refining. If there were no uses for copper sulfate, copper refiners would have to spend as much money getting rid of it as they make by selling it. It's just one of those wonderful things that can happen in the chemical industry. Like the pig, of which you can eat everything but the squeal, in copper refining they use everything but the smell and they're probably working on that too.

Being produced most economically as a by-product, the copper refiners have probably discouraged large-scale competition from any other formidable source. The largest producer, this department is informed, has three large plants and is now enlarging its copper mine production so that much greater figures in this industry may be looked for in the fall. Any increase in copper production, of course, increases the production of copper sulfate; they're the "Me and My Shadow" of the chemical industry.

The price of copper sulfate depends

Industry's Bookshelf

(*Continued from page 728*)

violet Radiation; 2, The Mechanism of the Emission of Radiant Energy; 12, Introduction to the Mechanism of Photochemical Processes; 13, Molecular Spectra in Relation to Photochemistry; 14, Spectroscopic Evidence for Dissociation as the Primary Photochemical Process; 15, Overall Photochemical Reactions; and 16, Photosensitized Processes) are written in non-mathematical fashion to give an understanding of the manner in which certain wavelengths may supply the activation energies of chemical reactions.

With Chapter One set aside for the Nature of Ultraviolet Radiation, the volume is divided into four parts. Part One (Chapters 2 to 11), is devoted to the Sources of Ultraviolet Radiations. Part Two (Chapters 12 to 28) includes Photochemical Processes. Part Three (Chapters 29 to 33) concerns Applications of Photochemistry to Industrial Products. Part Four (Chapters 34 to 44) gives Applications of Ultraviolet Rays in Biology. Copious footnotes supply sources of information and there is an author index as well as a subject index.

Apparatus for production of ultraviolet rays is described in Part One and there are many illustrations of each type. In Part Two, a few representative photochemical reactions are discussed at length to illustrate the manner in which the mechanism of a reaction may be studied. Literature of a wide variety of photochemical processes is also summarized. Fortunately, citations to all work subsequent to the first edition of the book (1925) are included and in some instances references to the earlier work have been broadened. In Part Three, the effects of light on industrial products are treated but it is pointed out that as yet but few investigators in this field have made full use of the current theoretical advances. In Part Four, emphasis has been placed upon the photochemical changes in compounds present in living cells.

Absorption spectra, fluorescence, photoelectric effects and other physical topics are covered by the volume only to the degree they contribute to an understanding of the mechanism of photochemical reactions. Purely physical applications like spectrographic analysis and fluorescence tests of materials are discussed only to an extent sufficient to make clear their relation to other more pertinent topics. However, sources of information regarding them are given.

Chemistry for Photographers, by Allen R. Greenleaf, American Photographic Publishing Co., Boston, Massachusetts, 1941. This book is recommended to the amateur photographer with a chemical background. He will find the answers to many of his questions very clearly given in his own language.

Starting with "Definitions of Chemical Terms" as Chapter I, the author and the reader are soon traveling on common ground, and with complete understanding. The book then progresses in very logical and clearly written steps from the preparation of the sensitized emulsion through developers, and reducers, development procedures, special development methods, desensitization, hardening, fixing, washing, fogs and stains, intensification and reduction, reversal processing, silver halide positive processes, toning, dichromated colloid, iron printing process, even to covering darkroom procedure and equipment.

In each step the chemical reactions and reasons for the use of each ingredient are explained fully. In many cases information is given which is not generally available in clear and compact form. The entire treatment of the subject is contained in 140 pages, but the important characteristics of developers and processes are explained. The book should not be considered as a handbook or reference work, but rather as a general treatise giving enough information from which to decide whether processes are of sufficient interest to the reader to encourage further investigation.

Throughout the style is interesting and good reading. There are many very frank statements as to the virtues or faults of developers, especially the so-called "fine grain" developers.

The last chapter is devoted to formulae of developers, fixing baths, reducers, toners, etc., all of which are referred to in the text and their uses and limitations explained.

The amateur will find that the time required to read or study this book is well spent, and it will certainly add much to the enjoyment of his hobby.

— Stephen L. Tyler

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upon the price of electrolytic copper. Trade insiders know how to watch the price of electrolytic copper and predict rises and falls in the price of the salt. Roughly speaking, the salt contains 25 per cent metallic copper and you work on the price from there. Its price is usually one-quarter the price of electrolytic copper.

Encouraging to the copper sulfate buyer is the news that all sources of production are working at capacity levels. New production mentioned before, according to the one gentleman in the trade who should know better than any other, will probably take care of all demands of industry.

This country is exporting quite a chunk of copper sulfate these days, principally to Mexico, Central America and South America. For a while the industry was chuckling to itself because it had been overlooked by the government on the Export License Control list. Seems that they listed copper and a lot of copper concentrates and things, some of which only contained 0.3 per cent copper whereas $CuSO_4$ is about 25 per cent copper. Somebody must have snitched, however, because it was put on the list June 3 and now licenses are required for its export. Exporters aren't worried, however, because of its extensive use in mining and the banana trade (good businesses for us) and on top of that there's the goodwill angle with our Southern neighbors to think about.

Foreign Literature Digest

(*Continued from page 760*)

other experimental conditions. This process was found to be successful both by Russian and German plants. The general process of absorption and desorption is described in detail. This process is the most applicable of all those listed in regard to profitableness, simplicity, plentiful and inexpensive agent and general efficiency.

P. 151-4 of same reference:

Cyanide Process for Gold and Silver Mining. I. N. Plaksin reviews the highlights of the development of the cyanidation process, particularly in Russia. Peter Bagration (Russian) in 1843 was the first to show the practicability and explain the conditions of dissolving metallic gold, silver and copper in aqueous solutions of alkali cyanides. In 1890 this process was first put into commercial operation in South Africa where the first cyanide plant was constructed. The process was first used in Russia in 1897. In recent years there has been a trend toward finding new solvents for gold which would not be as toxic as the cyanides.

PRICES CURRENT

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f.o.b. works are specified as such. Import chemicals are so designated.

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both.*

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1940 Average $1.20 - Jan. 1941 $1.16 - May 1941 $1.10

	Current Market	1941 Low	1941 High	1940 Low	1940 High
Acetaldehyde, drs, c-l, wks lb.	...	.11	...	.11	... .11
Acetaldol, 95%, 55 gal drs wks lb.	.11	.12	.11	.12	.11 .25
Acetamide, tech, lcl, kgs lb.	.28	.30	.28	.30	.28 .50
Acetanilid, tech, 150 lb bbls lb.	.31	.36	.29	.31	.27 .31
Acetic Anhydride, drs, f.o.b. wks, frt all'd lb.	.10½	.11½	.10½	.11½	.10½ .11½
Acetin, tech, drs lb.	...	.33	...	.33	... .33
Acetone, tks, f.o.b. wks, frt all'd lb.	...	.07	.06	.07	.05 .06
drs, c-l, f.o.b. wks, frt all'd lb.	...	.08½	.07½	.08½	.06½ .07½
Acetyl chloride, 100 lb cbys lb	.55	.68	.55	.68	.55 .68
Acetic, 28%, 400 lb bbls, c-l, wks 100 lbs.	2.23	2.48	2.23	2.48	... 2.23
glacial, bbls, c-l, wks 100 lbs.	7.62	7.87	7.62	7.87	... 7.62
glacial, USP bbls, c-l, wks 100 lbs.	10.25	10.50	10.25	10.50	... 10.25
Acetic Acid Glacial, *Synthetic* 99.5%, cbys, cases, delv lb.	...	.0843	.0843	.0918	... ...
99.5%, 110-gal dr, delv lb.	.0843	.0868	.0843	.0868	... ...
USP XI, cases, cbys, delv lb.	.1025	.11	.1025	.11	... ...
USP XI, 110-gal drs, delv lb.	.10¼	.11	.10¼	.11	... ...
CP, cases, cbys, delv lb.	.13½	.14	.13½	.14	... ...
CP, 55-gal drs, delv lb.	.13¼	.13½	.13¼	.13½	... ...
Acetylsalicylic, USP, 225 lb. bbls lb.	...	.45	...	.45	... .45
Adipic, kgs, bbls lb.	...	.31	...	.31	.31 .72
Anthranilic, ref'd, bbls lb.	1.15	1.20	1.15	1.20	1.15 1.20
tech bbls lb.	...	.75	...	.75	... .75
Ascorbic, bot oz.	1.85	2.10	1.85	2.10	2.25 3.00
Battery, cbys, wks 100 lbs.	1.60	2.55	1.60	2.55	1.60 2.55
Benzoic, tech, 100 lb kgs lb.	.43	.47	.43	.47	.43 .47
USP, 100 lb kgs lb.	.54	.59	.54	.59	.54 .59
Boric, tech, gran, 80 tons, bulk-bgs, delv ton *a*	93.50	96.00	93.50	96.00	... 96.00
Broenner's, bbls lb.	...	1.11	...	1.11	... 1.11
Butyric, edible, c-l, wks, cbys lb.	1.20	1.30	1.20	1.30	1.20 1.30
synthetic, c-l, drs, wks lb.	...	.22	...	.22	... .22
wks, lcl lb.	...	.23	...	.23	... .23
tks, wks lb.	...	.21	...	.21	... .21
Caproic, normal, drs lb.	.25	.30	.25	.35	.35 .40
Chicago, bbls lb.	...	2.10	...	2.10	... 2.10
Chlorosulfonic, 1500 lb drs. wks lb.	.03½	...	.03½	.05	.03½ .05
Chromic, 99¼%, drs, delv lb.	.15¼	.17¼	.15¼	.17¼	.15¼ .17¼
Citric, USP, crys, 230 lb bbls. lb. *b*	.20	.21	.20	.21	.20 .21½
anhyd, gran bbls lb. *b*	...	.23	...	.23	... .23
Cleve's, 250 lb bbls lb.	...	.65	...	.65	... .57
Cresylic, 99%, straw, HB, drs, wks, frt equal gal.	.68	.70	.68	.70	.68 .70
99%, straw, LB, drs, wks, frt equal gal.	.68	.70	.68	.70	.68 .75
resin grade, drs, wks, frt equal lb.	.08¾	.09¾	.08¾	.09¾	.08¾ .09¾
Crotonic, bbls, delv lb.	.26	.50	.21	.50	.21 .50
Formic, tech, 140 lb drs lb.	.10½	.11½	.10½	.11½	.10½ .11½
Fumaric, bbls lb.	.24	.28	.24	.28	.24 .75
Fuming, see Sulfuric (Oleum)					
Gallic, tech, bbls lb.	.90	.93	.90	.93	.75 .93
USP, bbls lb.	1.07	1.10	...	1.10	.92 .95
H, 225 lb bbls, wks lb.		.45	...	.45	... .45
Hydriodic, USP 47% lb.	2.42	2.44	2.42	2.44	2.30 2.42
Hydrobromic, 34% conct 155 lb cbys, wks lb.	.35	...	.35	...	.35 .44
Hydrochloric, see muriatic					
Hydrofluoric, 30%, 400 lb bbls, wks lb.	.06	.06½	.06	.06½	.06 .06½
Hydrofluosilicic, 35%, 400 bbls, wks lb.	.09	.09¼	.09	.09¼	.09 .09½
Lactic, 22%, dark, 500 lb bbls lb.	.02½	.03¾	.02½	.03¾	.02½ .03¾
22%, light ref'd, bbls lb.	.03½	.04¾	.03½	.04¾	.03½ .04¾
44%, light, 500 lb bbls lb.	.06½	.07¼	.06½	.07¼	.06½ .07¾
44%, dark, 500 lb bbls lb.	.05½	.06¾	.05½	.06¾	.05½ .06¾
50%, water white, 500 lb bbls lb.	.10½	.11½	.10½	.11½	.10½ .11½
Lauric, drs lb.	.16	.16½	.15	.16½	.12 .14½
Laurent's, 250 lb bbls lb.	...	.45	...	.45	.45 .46
Maleic, powd, kgs lb.	...	.30	...	.30	.30 .40
Malic, powd, kgs lb.	...	.47	...	.47	... .47
Mixed, tks, wks N unit	.05	.06	.05	.06	.05 .07¼
S unit	.0085	.009	.0085	.009	.008 .009
Monochloracetic, tech, bbls lb.	.15	.18	.15	.18	.15 .18
Monosulfonic, bbls lb.	...	1.50	...	1.50	1.50 1.60
Muriatic, 18°, 120 lb cbys, c-l, wks 100 lb.	...	1.50	...	1.50	... 1.50
tks, wks 100 lb.	...	1.05	...	1.05	1.00 1.05
20°, cbys, c-l, wks 100 lb.	...	1.75	...	1.75	... 1.75
tks, wks 100 lb.	...	1.15	...	1.15	1.10 1.15
22°, c-l, cbys, wks 100 lb.	...	2.25	...	2.25	... 2.25
tks, wks 100 lb.	...	1.65	...	1.65	1.60 1.65
CP, cbys lb.	.06½	.08	.06½	.08	.06½ .08
N & W, 250 lb bbls lb.	.85	.87	.85	.87	.85 .87
Naphthenic, 240-280 s.v., drs lb.	.10	nom.	.10	nom.	nom. .14
Naphthionic, tech, 250 lb bbls lb.	.60	.65	.60	.65	.60 .65
Nitric, 36°, 135 lb cbys, c-l, wks 100 lb. *c*	...	5.00	...	5.00	... 5.00
38°, c-l, cbys, wks 100 lb. *c*	...	5.50	...	5.50	... 5.50
40°, cbys, c-l, wks 100 lb. *c*	...	6.00	...	6.00	... 6.00
42°, c-l, cbys, wks 100 lb. *c*	...	6.50	...	6.50	... 6.50
CP, cbys, delv lb.	.11½	.13	.11½	.13	.11½ .13
Oxalic, 300 lb bbls, wks, or N Y lb.	.10¾	.14	.10¾	.14	.10¾ .12
Phosphoric, 85%, USP, cbys lb.	...	.12	...	.12	.12 .14
50%, acid, c-l, drs, wks lb.	...	.12	...	.12	.06 .12
75%, acid, c-l, drs, wks lb.	...	.07½	...	.07½	... .07½
Picric, kgs, wks lb.	...	.35	...	.35	.35 .40
Propionic, 98% wks, drs lb.	...	.25	...	.25	... .25
80% lb.	...	.14	...	.14	.14 .20
Pyrogallic, tech, lump, pwd, bbls lb.	...	1.15	...	1.20	1.05 1.20
cryst, USP lb.	1.70	2.25	1.70	2.25	1.55 2.25
Ricinoleic, bbls lb.	.32	.37	.32	.37	.27 .33
Salicylic, tech, 125 lb bbls, wks lb.	...	.33	...	.33	... .33
USP, bbls lb.	.35	.40	.35	.40	.35 .40
Succinic, bbls lb.	...	.75	...	.75	... .75
Sulfanilic, 250 lb bbls, wks lb.	...	.17	...	.17	.17 .18
Sulfuric, 60°, tks, wks ton	...	13.00	...	13.00	... 13.00
c-l, cbys, wks 100 lb.	...	1.25	...	1.25	... 1.25
66°, tks, wks ton	...	16.50	...	16.50	... 16.50
c-l, cbys, wks 100 lb.	...	1.50	...	1.50	... 1.50
CP, cbys, wks lb.	.06½	.08	.06½	.08	.06½ .08
Fuming (Oleum) 20% tks, wks ton	...	18.50	...	18.50	... 18.50
Tannic, tech, 300 lb bbls lb.	.54	.56	.54	.56	.44 .56
Tartaric, USP, gran, powd, 300 lb bbls lb.	...	.63½	.46¼	.63½	.35¼ .46¼
Tobias, 250 lb bbls lb.	.55	.60	.55	.60	.55 .60
Trichloroacetic bottles lb.	2.00	2.50	2.00	2.50	2.00 2.50
kgs lb.		no prices		no prices	no prices
Tungstic, tech, bbls lb.					
Albumen, light flake, 225 lb. bbls lb.	.55	.62	.55	.62	.55 .62
dark, bbls lb.	.13	.18	.13	.18	.13 .18
egg, edible lb.	.95	1.00	.65	1.00	.53 .65
Alcohol, Amyl (from Pentane) tks, delv lb.	...	.111	...	.111	... .111
c-l, drs, delv lb.	...	.121	...	.121	... .121
lcl, drs, delv lb.	...	.131	...	.131	... .131
Amyl, normal l-c-l drs Wyandotte, Mich. lb.	...	.25	...	.25	... .25
secondary, tks, delv lb.					
drs, c-l, delv E of Rockies lb.	...	.09½	...	.09½	... .09½
tertiary, rfd, l-c-l, drs, f.o.b., Wyandotte, frt all'd lb.	...	.09	...	.09	... .09
Benzyl, cans lb.	...	.68	...	.68	.68 1.00
Butyl, normal, tks, f.o.b. wks, frt all'd lb. *d*	...	.09	...	.09	... .09
c-l, drs, f.o.b. wks, frt all'd lb. *d*	...	.10	...	.10	... .10
Butyl, secondary, tks, delv lb. *d*	...	.08	.07¼	.08	... .07¼
c-l, drs, delv lb. *d*	...	.09	.08¼	.09	... .08¼
Butyl, tert denat cl drs lb.	...	.12½	...	.12½	... ...
lcl drs lb.	...	.13	...	.13	... ...
tks lb.	...	.11½	...	.11½	... ...
Capryl, drs, tech, wks lb.	...	.85	...	.85	... .85
Cinnamic, bottles lb.	2.33	2.95	2.33	2.95	2.00 2.50
Denatured, CD, 14, c-l drs, wks gal. *e*	.36½	.38½	.36½	.38½	.32½ .36½
tks, East, wks gal.	.30½	.32½	...	.26½	.25½ .26½
Western schedule, c-l, drs, wks gal. *e*	...	.40½	...	.40½	.34½ .37½
Denatured, SD, No. 1, tks,	...	.27	...	.28½	.23½ .24½

a Powdered boric acid $5 a ton higher in each case; USP $15 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls; *y* Price given is per gal.

c Yellow grades 25c per 100 lbs. less in each case; *d* Spot prices are 1c higher: *e* Anhydrous is 5c higher in each case.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

Church & Dwight Co., Inc.

Established 1846

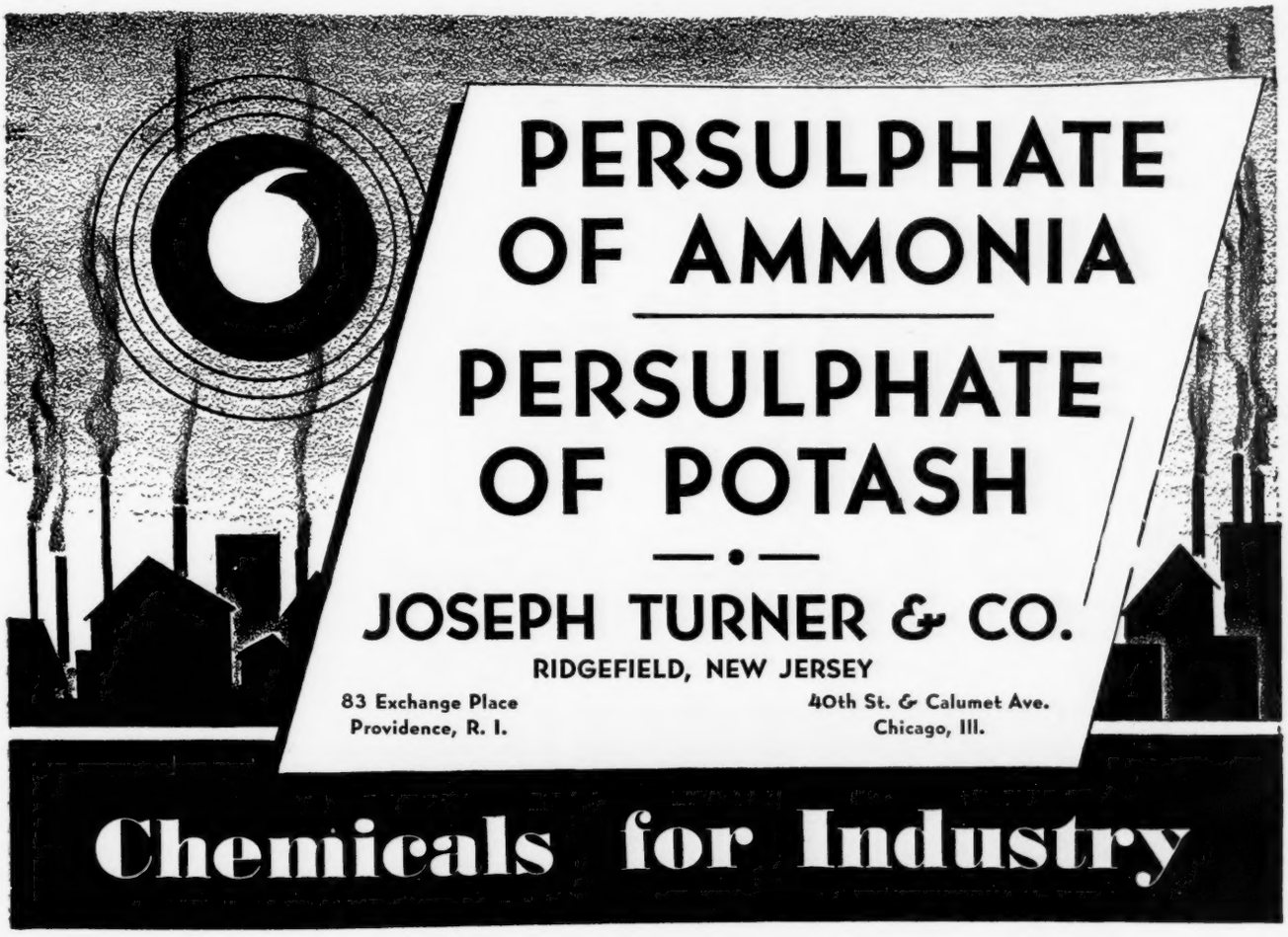
70 PINE STREET NEW YORK

Bicarbonate of Soda

Sal Soda

Monohydrate of Soda

Standard Quality



PERSULPHATE OF AMMONIA

PERSULPHATE OF POTASH

JOSEPH TURNER & CO.

RIDGEFIELD, NEW JERSEY

83 Exchange Place
Providence, R. I.

40th St. & Calumet Ave.
Chicago, Ill.

Chemicals for Industry

	Current Market	1941 Low	1941 High	1940 Low	1940 High
Alcohols (continued):					
Diacetone, pure, c-l drs, delv lb. *f*	.10½	.11½	.09½	.11½	.12
tech, contract, drs, c-l, delv lb.	.10	.11	.09	.11	.11½
Ethyl, 190 proof, molasses, tks gal. *g*	...	5.96½	...	5.96½	5.93½ 5.94½
c-l, drs gal. *g*	...	6.02½	...	...	5.92½ 6.00½
c-l, bbls gal. *g*	...	6.03½	...	...	6.00½ 6.01½
Furfuryl, tech, 500 lb drs lb.	.20	.25	.20	.25	.25 .35
Hexyl, secondary tks, delv lb.	...	.12	...	.12	... .12
c-l, drs, delv lb.	...	.13	...	.13	... .13
Normal, drs, wks lb.	3.25	3.50	3.25	3.50	3.25 3.50
Isoamyl, prim, cans, wks lb.	...	.32	...	.32	... .32
drs, lcl, delv lb.	...	.27	...	.27	... .27
Isobutyl, ref'd, lcl, drs lb.	...	.079	...	.079	... .079
c-l, drs lb.	...	.069	...	.069	... .069
tks lb.	...	.069	...	.069	... .069
Isopropyl, ref'd, 91%, c-l, drs, f.o.b. wks, frt all'd lb.	...	.66½	...	.66½	... .65
Ref'd 98%, drs, f.o.b. wks, frt all'd gal.	...	.65	...	.65	... .65
Tech 91%, drs, above terms gal.	.35	.40	.35	.40	... .33½
tks, same terms gal.	...	.30	...	.30	... .28½
Tech 98%, drs, above terms gal.	...	.44	...	.44	.36 .37½
tks, above terms gal.	...	.37½	...	.37½	.31 .32½
Spec. Solvent, tks, wks gal.	...	.28	...	.28	.23½ .25½
Aldehyde ammonia, 100 gal drs lb.	.65	.70	.65	.70	.65 .82
Aldehyde Bisulfite, bbls, delv lb.	...	.17	...	.17	... .17
Aldol, 95%, 55 and 110 gal, drs, delv lb.	.11	.12	.11	.12	.11 .12
Alphanaphthol, crude, 300 lb. bbls lb.	...	52	...	.52	... .52
Alphanaphthylamine, 350 lb bbls lb.	...	.32	...	.32	.32 .34
Alum, ammonia, lump, c-l, bbls, wks 100 lb.	...	3.75	...	3.75	... 3.75
delv NY, Phila 100 lb.	...	3.75	...	3.75	... 3.75
Granular, c-l, bbls wks 100 lb.	...	3.50	...	3.50	... 3.50
Powd, c-l, bbls, wks 100 lb.	...	3.90	...	3.90	... 3.90
Chrome, bbls 100 lb.	no prices		no prices		6.50 6.75
Potash, lump, c-l, bbls, wks 100 lb.	...	4.00	...	4.00	... 4.00
Granular, c-l, bbls, wks 100 lb.	...	3.75	...	3.75	... 3.75
Powd, c-l, bbls, wks 100 lb.	...	4.15	...	4.15	... 4.15
Soda, bbls, wks 100 lb.	...	3.25	...	3.25	... 3.25
Aluminum metal, c-l, NY 100 lb.	17.00	18.00	17.00	18.00	18.00 20.00
Acetate, 20%, bbls lb.	.08	.09	.08	.09	.07½ .09
Basic powd, bbls, delv lb.	.35	.50	.35	.50	.35 .50
32% basic, bbls, delv lb.	.09½	.12	.09½	.12	... ...
Insoluble basic powder, bbls, delv lb.	.35	.40	.35	.40	... ...
Soluble normal pwdr lb.	...	.33	...	.33	... ...
Soluble basic powder lb.	...	.33	...	.33	... ...
Chloride anhyd 99% wks lb.	.08	.12	.08	.12	.08 .12
93%, wks lb.	.05	.08	.05	.08	.05 .08
Crystals, c-l, drs, wks lb.	.06	.06½	.06	.06½	.06 .06½
Solution, drs, wks lb.	.02¾	.03¼	.02¾	.03¼	.02¾ .03¼
Formate, 30% sol bbls, c-l, delv lb.	...	.13	...	.13	... .13
Hydrate, 96%, light, 90 lb. bbls, delv lb.	.12½	.13	.12½	.13	.12½ .13½
heavy, bbls, wks lb.	.029	.03½	.029	.03½	.029 .03½
Oleate, drs lb.	.17½	.20	.17½	.20	.16¾ .20
Palmitate, bbls lb.	.20½	.21½	.20½	.21½	.20½ .24½
Resinate, pp., bbls lb.	...	.15	...	.15	... .15
Stearate, 100 lb bbls lb.	.18	.19	.18	.19	.19 .20
Sulfate, com, c-l, bgs, wks 100 lb.	...	1.15	...	1.15	... 1.15
c-l, bbls, wks 100 lb.	...	1.35	...	1.35	... 1.35
Sulfate, iron-free, c-l, bags, wks 100 lb.	...	1.60	...	1.60	1.60 1.80
c-l, bbls, wks 100 lb.	...	1.80	...	1.80	1.65 1.80
Aminoazobenzene, 110 lb kgs lb.	...	1.15	...	1.15	... 1.15
Ammonia anhyd fert com, tks lb.	...	.05	.04½	.05	.04½ .05
Ammonia anhyd, 100 lb cyl lb.	...	.16	...	.16	... .16
50 lb cyl lb.	...	.22	...	.22	... .22
26°, 800 lb drs, delv lb.	.02¼	.02½	.02¼	.02½	.02¼ .02½
Aqua 26°, tks, NH_3 cont.	...	.05¼ z	.04	.05¼ z	.04 .05¼
Ammonium Acetate, kgs lb.	.27	.33	.27	.33	.27 .33
Bicarbonate, bbls, f.o.b. wks 100 lb.	.0564	.0614	.0564	.0614	... .0564
Bifluoride, 300 lb bbls lb.	.14	.16½	.14	.16½	.14½ .16½
Carbonate, tech, 500 lb bbls lb.	.08¼	.09¼	.08¼	.09¼	.08¼ .11
Chloride, White, 100 lb bbls, wks 100 lb.	4.45	...	4.45	...	4.45 4.90
Gray, 250 lb bbls, wks 100 lb.	5.50	5.75	5.50	5.75	5.50 6.25
Lump, 500 lb cks spot lb.	no prices		no prices		no prices
Lactate, 500 lb bbls lb.	.15	.16	.15	.16	.15 .16
Laurate, bbls lb.	...	.23	...	.23	... .23
Linoleate, 80% anhyd, bbls lb.	...	.12	...	.12	... .12
Naphthenate, bbls lb.	...	.17	...	.17	... .17
Nitrate, tech, bbls lb.	.0435	.0455	.0435	.0455	... .0455
Oleate, drs lb.	...	.14	...	.14	... .14
Oxalate, neut, cryst, powd, bbls lb.	.19	.25	.19	.25	.19 .25
Perchlorate, kgs lb.	no stocks		no stocks		no stocks
Persulfate, 112 lb kgs lb.	.21	.22	.21	.22	.21 .22

f Prices are 1c higher in each case.
g Grain alcohol 25c a gal. higher in each case. ** On a delv. basis.
z On a f.o.b. wks. basis.

	Current Market	1941 Low	1941 High	1940 Low	1940 High
Ammonium (continued):					
Phosphate, diabasic tech, powd, 325 lb bbls lb.	.07¼	...	.07¼	.09¼	.07¼ .10
Ricinoleate, bbls lb.	...	.15	...	.15	... .15
Stearate, anhyd, bbls lb.	...	.24½	...	.24½	... .24½
Paste, bbls lb.	...	.06½	...	.06½	... .06½
Sulfate, dom, f.o.b., bulk ton	29.00	30.00	29.00	30.00	... 29.00
Sulfocyanide, pure, kgs lb.	...	.65	...	.65	... .65
Amyl Acetate (from pentane) tks, delv lb.	...	.105	...	.105	... .105
c-l, drs, delv lb.	...	.115	...	.115	... .115
lcl, drs, delv lb.	...	.125	...	.125	... .125
tech drs, delv lb.	...	.11½	.11½	.12	... .12
Secondary, tks, delv lb.	...	.08½	...	.08½	... .08½
c-l, drs, delv lb.	...	.09½	...	.09½	... .09½
tks, delv lb.	...	.08½	...	.08½	... .08½
Chloride, norm, drs, wks lb.	.56	68	.56	.68	.56 .68
mixed l c l drs, wks lb.	...	.07	.0565	.07	.0535 .0665
tks, wks lb.	...	.05	.0465	.05	... .0465
Mercaptan, drs, wks lb.	...	1.10	...	1.10	... 1.10
Oleate, lcl, wks, drs lb.	...	.25	...	.25	... .25
Stearate, lcl, wks, drs lb.	...	.26	...	.26	... .26
Amylene, drs, wks lb.	.102	.11	.102	.11	.102 .11
tks, wks lb.	...	.09	...	.09	... .09
Amylnaphthalenes, see Mixed Amylnaphthalenes					
Aniline Oil, 960 lb drs and tks lb.	...	.14½	...	.14½	... .14½
Annatto fine lb.	.34	.39	.34	.39	.34 .39
Anthracene, 80-85% lb.	...	.55	...	.55	... .55
Anthraquinone, sublimed, 125 lb bbls lb.	...	.65	...	.65	... .65
Antimony metal slabs, ton lots lb.	.14	nom.	.14	.16½	... .14
Butter of, see Chloride					
Chloride, soln, cbys lb.	...	.17	...	.17	... .17
Needle, powd, bbls lb.	...	.16	...	.16	.16 .22
Oxide, 500 lb bbls lb.	.12	.14½	.12	.14½	.13 .15¾
Salt, 63% to 65%, drs lb.	...	.28	...	.28	.28 nom.
Archil, conc, 600 lb bbls lb.	no prices		no prices		no prices
Double, 600 lb bbls lb.	no prices		no prices		no prices
Aroclors, wks lb.	.18	.30	.18	.30	.18 .30
Arrowroot, bbls lb.	.09½	.10	.09½	.10	.09 .10
Arsenic, Metal lb.	no prices		no prices		... ...
Red, 224 lb cs kgs lb.	no prices		no prices		.17½ .18
White, 112 lb kgs lb.	.03½	04¼	.03½	.04¼	.03 .04¼
Barium Carbonate precip, 200 lb bgs, wks ton	45.00	50.00	45.00	50.00	45.00 62.50
Nat (witherite) 90% gr, c-l, wks, bgs ton	...	43.00	...	43.00	43.00 47.00
Chlorate, 112 lb kgs, NY lb.	no prices		...	.45	.20 .45
Chloride, 600 lb bbls, delv, zone 1 ton	77.00	92.00	77.00	92.00	77.00 92.00
Dioxide, 88%, 690 lb drs lb.	...	.10	...	.10	.10 .12
Hydrate, 500 lb bbls lb.	.05¾	.07	.05½	.07	.05½ .07
Nitrate, bbls lb.	.09½	.10½	.08½	.10½	.09½ .10½
Barytes, floated, 350 lb bbls c-l, wks ton	...	25.15	...	25.15	... 25.15
Bauxite, bulk, mines ton	7.00	10.00	7.00	10.00	7.00 10.00
Bentonite, c-l, 325 mesh, bgs, wks ton	...	16.00	...	16.00	... 16.00
200 mesh ton	...	11.00	...	11.00	... 11.00
Benzaldehyde, tech, 945 lb. drs, wks lb.	.45	.55	.45	.55	.55 .60
Benzene (Benzol), 90%, Ind. 8000 gal tks, ft all'd gal.	...	.14	...	.14	.14 .16
90% c-l, drs gal.	...	.19	...	.19	.19 .21
Ind pure, tks, frt all'd gal.	...	.14	...	.14	.14 .16
Benzidine Base, dry, 250 lb. bbls lb.	...	.70	...	.70	... .70
Benzoyl Chloride, 500 lb drs lb.	.23	.28	.23	.28	.23 .28
Benzyl Chloride, 95-97% rfd, drs lb.	...	.22	.19	.22	.19 .21
Beta-Naphthol, 250 lb bbls, wks lb.	.23	.24	.23	.24	.23 .24
Naphthylamine, sublimed, 200 lb bbls lb.	1.25	...	1.25	1.35	1.25 1.35
Tech, 200 lb bbls lb.	.51	.52	.51	.52	.51 .52
Bismuth metal lb.	...	1.25	...	1.25	... 1.25
Chloride, boxes lb.	3.20	3.25	3.20	3.25	3.20 3.25
Hydroxide, boxes lb.	3.35	3.46	3.35	3.46	3.35 3.46
Oxychloride, boxes lb.	3.10	3.19	3.10	3.19	... 3.10
Subbenzoate, boxes lb.	...	3.40	...	3.40	3.25 3.36
Subcarbonate, kgs lb.	1.73	1.76	1.73	1.76	1.73 1.76
Subnitrate, fibre, drs lb.	1.20	1.51	1.20	1.51	1.48 1.51
Trioxide, powd, boxes lb.	...	3.65	...	3.65	3.56 3.57
Blanc Fixe, Pulp, 400 lb. bbls, wks ton *h*	35.00	42.50	35.00	42.50	50.00 80.00
Bleaching Powder, 800 lb drs, c-l, wks, contract 100 lb.	2.00	2.85	2.00	2.85	... 2.85
lcl, drs, wks lb.	2.25	3.35	2.25	3.35	2.25 3.35
Blood, dried, f.o.b., NY unit	...	3.25	2.40	3.25	2.25 3.35
Chicago, high grade unit	...	3.15	2.50	3.50	2.00 3.50
Imported shipt unit	...	3.05	2.45	3.10	2.25 3.30
Blues, Bronze Chinese lb.	...	.33	...	.33	.33 .37
Prussian Soluble lb.	...	.33	.33	.34	.33 .34
Milori, bbls lb.	...				
Ultramarine,* dry, wks, bbls lb.	...	.11	...	.11	... .11
Regular grade, group 1 lb.	...	.16	...	.16	... .16
Pulp, Cobalt grade lb.	.22	.24	.22	.24	.22 .27
Bone, 4½ + 50% raw, Chicago ton	...	34.00	30.00	34.00	30.00 33.00
Bone Ash, 100 lb kgs lb.	.06	.07	.06	.07	.06 .07
Meal, 3% & 50%, imp ton	...	34.00	31.50	33.00	31.50 32.50
Domestic, bgs, Chicago ton	34.00	35.00	32.00	35.00	29.00 32.00

h Lowest price is for pulp, highest for high grade precipitated; *i* Crystals $6 per ton higher; USP, $15 higher in each case; *Freight is equalized in each case with nearest producing point.

Better ALKYDS!

AROPLAZ* is our designation for pure and modified alkyds, which are now being manufactured in our large additional unit in Newark, N. J.

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60 East 42nd Street New York, N. Y.

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"S & W" ESTER GUM—all types
"AROFENE"*—pure phenolics
"AROCHEM"*—modified types
"CONGO GUM"—raw, fused and esterified
"AROPLAZ"*—alkyds
NATURAL RESINS—all standard grades

*Registered U. S. Patent Office

A RECORD OF SATISFACTION with LEADING USERS

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Many large shippers are using Fulton Waterproof Bags with gratifying results. Dry chemicals and mineral products look better and sell better . . . they carry and store safely in these light but tough containers that effect worthwhile economies in handling.

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Waterproof
Siftproof
Acid resistant

Fulton Bag & Cotton Mills
Manufacturers Since 1870
ATLANTA ST. LOUIS DALLAS NEW YORK
MINNEAPOLIS NEW ORLEANS KANSAS CITY, KAN.

	Current Market	1941 Low	1941 High	1940 Low	1940 High
Borax, tech, gran, 80 ton lots, sacks, delv ton *i*	...	43.00	...	43.00	...	43.00
bbls, delv ton *i*	...	53.00	...	53.00	...	53.00
Tech, powd, 80 ton lots, sacks ton	...	48.00	...	48.00	47.00	48.00
bbls, delv ton	...	58.00	...	58.00	57.00	58.00
Bordeaux Mixture, drs lb.	.11	.11½	.11	.11½	.11	.11½
Bromine, cases lb.	.25	.30	.25	.30	.25	.43
Bronze, Al, pwd, 300 lb drs lb.	...	.57	...	.57	...	.57
Gold, blk lb.	.60	.65	.60	.65	.60	.65
Butanes, com 16-32° group 3 tks lb.	.02½	.03	.02½	.03	.02¼	.03¾
Butyl, acetate, norm drs, frt all'd lb.	.10	.11	.10	.11	...	.10
tks, frt all'd lb	.09	.10	.09	.10	...	.09
Secondary, tks, frt all'd lb.	...	.07¼	...	.07¼	...	.07¼
drs, frt all'd lb.	.08¼	.08¾	.08¼	.08¾	.07½	.08
Aldehyde, 50 gal drs, wks lb.	.15½	.17½	.15½	.17½	.15½	.17½
Carbinol, norm (see Normal Amyl Alcohol)						
Crotonate, norm, 55 and 110 gal drs, delv lb.	...	.35	...	.35	...	.35
Lactate lb.	...	.23½	...	.23½	.23½	.24½
Oleate, drs, frt all'd lb.	...	.25	...	.25	...	.25
Propionate, drs lb.	.16½	.17	.16½	.17	.16½	.17
tks, delv lb.	...	.15½	...	.15½	...	.15½
Stearate, 50 gal drs lb.	...	.28½	...	.28½	...	.28½
Tartrate, drs lb.	no prices	.35½	.55	.60	.55	.60
Butyraldehyde, drs, lcl, wks lb.	.90	nom.	.80	.90	.80	.85
Cadmium Metal lb.	...	1.10	...	1.10	.75	.85
Sulfide, orange, boxes lb.						
Calcium, Acetate, 150 lb bgs c-l, delv 100 lb.	...	1.90	...	1.90	...	1.90
Arsenate, c-l, E of Rockies, dealers, drs lb.	.06½	.06¾	.06	.06¾	.06	.07¼
Carbide, drs lb.	...	.04¾	...	.04¾	.05	.06
Carbonate, tech, 100 lb bgs, c-l ton	16.00	20.00	16.00	20.00	...	...
Chloride, flake, 375 lb drs, burlap bgs, c-l, delv ton	...	20.50	...	20.50	...	22.00
paper bags, c-l, delv ton	20.50	35.00	20.50	35.00	20.50	36.00
Solid, 650 lb drs, c-l, delv ton	19.00	33.00	19.00	33.00	19.00	35.00
Ferrocyanide, 350 lb bbls wks lb.	...	.20	...	.20	...	.20
Gluconate, Pharm, 125 lb bbls lb.	.50	.57	.50	.57	.50	.57
Levulinate, less than 25 bbl lots, wks lb.	...	3.00	...	3.00	...	3.00
Nitrate, 100 lb bags ton	no prices		no prices		28.00	29.00
Palmitate, bbls lb.	.22	.24	.22	.24	.22	.24
Phosphate, tribasic, tech, 450 lb bbls lb.	.0635	.0705	.0635	.0705	.0635	.07½
Resinate, precip, bbls lb.	.13	.14	.13	.14	.13	.14
Stearate, 100 lb bbls lb.	.20½	.22½	.20½	.22½	.20½	.22½
Camphor, slabs lb.	.73	.74	.73	.83	.82	.84
Powder lb.	.73	.74	.74	.83	.82	.84
Carbon Bisulfide, 500 lb drs lb.	.05	.05¾	.05	.05¾	.05	.05¾
Black, c-l, bgs, f.o.b. plants lb.	...	.03325	...	.03325	.02¾	.03¾
lcl, bgs, f.o.b. whse lb.	...	.07025	...	.07025	...	.06525
Decolorizing, drs, c-l lb.	.08	.15	.08	.15	.08	.15
Dioxide, Liq 20-25 lb cyl lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, 55 or 110 gal drs, c-l, delv lb.	...	.66½	...	.66½	...	.66½
Casein, Standard, Dom, grd lb.	.20	...	.11½	.20	.10	.14½
80-100 mesh, c-l bgs lb.	...	.20½	.12	.20½	.11	.15
Castor Pomace, 5½ NH_3, c-l, bgs, wks ton	15.00	...	15.00	...	15.00	17.50
Imported, ship, bgs ton	no prices		no prices		...	20.00
Celluloid, Scraps, ivory cs lb.	.12	.15	.12	.15	.12	.15
Transparent, cs lb.	...	.20	..	.20	...	.20
Cellulose, Acetate, frt all'd, 50 lb kgs lb.	...	.30	...	.30	.30	.34
Triacetate, flake, frt all'd lb.	...	.30	...	.30	...	...
Chalk, dropped, 175 lb bbls lb.	...	.02¾	...	.02¾	.02¾	.03¾
Precip, heavy, 560 lb cks lb.	...	.03¼	...	.03¼	.02¾	.03¼
Light, 250 lb cks lb.	...	.03¼	...	.03¼	.03¼	.04
Charcoal, Hardwood, lump, blk, wks bu.	...	.15	...	.15	...	.15
Softwood, bgs, delv* ton	25.00	36.00	25.00	36.00	25.00	36.00
Willow, powd, 100 lb bbls, wks lb.	.06	.07	.06	.07	.06	.07
Chestnut, clarified tks, wks lb.	...	.01¾	...	.01¾	...	.01¾
25%, bbls, wks lb.	...	.02⅜	...	.02⅜	...	.02½
China Clay, c-l, blk mines ton	...	7.60	...	7.60	7.60	9.50
Imported, lump, blk ton	18.60	25.00	...	18.60	25.00	26.00
Chlorine, cyls, lcl, wks, contract lb.	...	.07¼	...	.07¼	.07½	.08½
cyls, c-l, contract lb *j*	...	.05¼	...	.05¼	...	.05¼
Liq. tk, wks, contract 100 lb.	...	1.75	...	1.75	...	1.75
Multi, c-l, cyls, wks, cont lb.	...	.019	...	.019	...	.019
Chloroacetophenone, tins, wks lb.	3.00	3.50	3.00	3.50	3.00	3.50
Chlorobenzene, Mono, 100 lb, drs, lcl, wks lb.	...	.08	.06	.08	.06	.08
Chloroform, tech, 1000 lb drs lb.	...	.20	...	.20	.20	.21
USP, 25 lb tins lb.	...	.30	...	.30	.30	.31
Chloropicrin, comml cyls lb.	...	.80	...	.80	...	.80
Chrome, Green, CP lb.	.21	.25	.21	.25	.21	.25
Yellow lb.	.13½	.14½	.13½	.14½	.13½	.14½
Chromium Acetate, 8% Chrome, bbls lb.	...	.05¾	...	.05¾	...	.05¾

j A delivered price; * Depends upon point of delivery.

	Current Market	1941 Low	1941 High	1940 Low	1940 High
Chromium (continued) Fluoride, powd, 400 lb bbl lb.	.27	.28	.27	.28	.27	.28
Coal tar, bbls bbl.	7.50	7.75	7.50	7.75	7.50	8.00
Cobalt Acetate, bbls lb.	...	.80¼	...	.80½	...	.80½
Carbonate tech, bbls lb.	...	1.58	...	1.58	1.38	1.60
Hydrate, bbls lb.	...	1.98	...	1.98	...	1.78
Linoleate, solid, bbls lb.	...	.33	...	.33	...	.33
paste, 6%, drs lb.	...	.31	...	.31	...	.31
Oxide, black, bgs lb.	...	1.84	...	1 84	...	1.84
Resinate, fused, bbls lb.	...	.13½	...	13½	...	.13½
Precipitated, bbls lb.	...	.34	...	.34	...	.34
Cochineal, gray or bk bgs lb.	.37	.38	.37	.38	.37	.38
Teneriffe silver, bgs lb.	.38	.39	.38	.39	.38	.39
Copper, metal, electrol 100 lb.	12.00	12.50	12.00	12.50	11.00	12.00
Acetate, normal, bbls, dlvd lb.	...	.24	.22	.24	.22	.24
Carbonate, 52-54% 400 lb bbls lb.	.1650	.18	.1650	.18	.1570	.169
Chloride, 250 lb bbls lb.	.16	.18	.16	.18	.16	.18
Cyanide, 100 lb drs lb.	.34	.36	.34	.36	...	.34
Oleate, precip, bbls lb.	...	.20	.	.20	...	.20
Oxide, black, bbls, wks lb.	.18½	.20	.18	.20	.18	.18¾
red 100 lb bbls lb.	.19	.21	.19	.21	.19½	.20½
Sub-acetate verdigris, 400 lb bbls lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls, c-l, wks, 100 lb.	...	4.75	..	4.75	4.45	4.75
Copperas crys and sugar bulk c-l, wks ton	...	17.00	14.00	17.00	14.00	20.00
Corn Sugar, tanners, bbls 100 lb.	...	4.05	3.36	4.05	2.99	3.39
Corn Syrup, 42°, bbls 100 lb.	...	3.52	3.42	3.52	3.02	3.47
43°, bbls 100 lb.	...	3.57	3.47	3.57	3.07	3.52
Cotton, Soluble, wet 100 lb. bbls lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, powd & gran 300 lb bbls lb.	...	.52½	38¼	.52½	.28¼	.38¼
Creosote, USP 42 lb cbys lb.	.45	.47	.45	.47	.45	.47
Oil, Grade 1 tks gal.	.13½	.14½	.13½	.14½	.13½	.14
Grade 2 gal.	.122	.132	.122	.132	.122	.132
Cresol, USP, drs lb.	.09¾	.10¼	.09¾	.10¼	.09¾	.10¼
Crotonaldehyde, 97%, 55 and 110 gal drs, wks lb.	...	.13	.11	.13	.11	.12
Cutch, Philippine, 100 lb. bale lb.	...	.04¾	...	.04¾	.04	.04½
Cyanamid, pulv, bags, c-l, frt all'd, nitrogen basis, unit	no prices		...	1.40	...	1.40
Derris root 5% rotenone, bbls lb.	.21	.23	.21	.23	.21	.30
Dextrin, corn, 140 lb bgs f.o.b., Chicago 100 lb.	...	4.00	3.80	4.00	3.40	3.80
British Gum, bgs 100 lb.	...	4.25	4.05	4.25	3.65	4.10
Potato, Yellow, 220 lb bgs lb.	...	.08	...	.08	...	.07¾
White, 220 lb bgs, lcl lb.	.08½	.09	.08½	.09	.08½	.09
Tapioca, 200 bgs, lcl lb.	...	.0715	...	.0715	...	.0715
White, 140 lb. bgs 100 lb.	...	3.95	3.75	3.95	3.35	3.75
Diamylamine, c-l, drs, wks lb.	...	.47	...	.47	...	.47
lcl drs, wks lb.	...	.50	.48	.50	...	.50
Diamylene, drs, wks lb.	.095	.102	.095	.102	.095	.102
tks, wks lb.	...	.08½	...	.08½	...	.08½
Diamylether, wks, drs lb.	.085	.092	.085	.092	.085	.092
tks, wks lb.	...	.075	...	.075	...	.075
Diamylnaphthalene, l-c-l, drs, f.o.b. wks, lb.	...	.17	.17	.20	...	...
Diamylphthalate, drs, wks lb.	.21	.21½	.21	.21½	.21	.21½
Diamyl Sulfide, drs, wks lb.	...	1.10	...	1.10	...	1.10
Diatomaceous Earth, see Kieselguhr.						
Dibutoxy Ethyl Phthalate, drs, wks lb.	...	.35	...	.35	...	.35
Dibutylamine, lcl, drs, wks lb.	...	.53	...	.53	...	.53
c-l drs, wks lb.	...	.50	...	.50	...	.50
tks, wks lb.	...	.48	...	.48	...	.48
Dibutyl Ether, drs, wks, lcl lb.	...	.25	...	.25	...	.25
Dibutylphthalate, drs, wks, frt all'd lb.	.19	.19½	.19	.19½	.19	.19½
Dibutyltartrate, 50 gal drs lb.	...	.50	...	.50	...	.50
Dichlorethylene, drs lb.	...	.25	...	.25	...	.25
Dichloroethylether, 50 gal drs, wks lb.	.15	.16	.15	.16	.15	.16
tks, wks lb.	...	.14	...	.14	...	.14
Dichloromethane, drs, wks lb.	...	.23	...	.23	...	.23
Dichloropentanes, drs, wks lb.	...	.04	.025	.04	...	.025
tks, wks lb.	...	.025	.0221	.025	...	.0221
Diethanolamine, tks, wks lb.	...	.22½	...	.22½	...	.22½
Diethylamine, 300 lb drs, lcl, f.o.b., wks lb.	...	.70	...	.70	...	.70
Diethylamino Ethanol, l-c-l, drs, f.o.b. Wyandotte, frt all'd E. Miss. lb.	...	.75	...	.75	...	...
Diethylaniline, 850 lb drs lb.	...	.40	...	.40	.40	.52
Diethylcarbonate, com drs lb.	...	.25	...	.25	...	.25
Diethylorthotoluidin, drs lb.	.64	.67	.64	.67	.64	.67
Diethylphthalate, 1000 lb drs lb.	.19	.19½	.19	.19½	.19	.19½
Diethylsulfate, tech, drs, wks, lcl lb.	.13	.14	.13	.14	.13	.14
Diethyleneglycol, drs lb.	.14	.15½	.14	.15½	.14½	.15½
Mono ethyl ethers, drs lb.	.14½	.15½	.14½	.15½	.14½	.16
tks, wks lb.	...	.13½	...	.13½	...	.13½
Mono butyl ether, drs lb.	.22½	.24½	.22½	.24½	.22½	.24½
tks, wks lb.	...	.22	...	.22	...	.22
Diethylene oxide, 50 gal drs, wks lb.	.20	.24	.20	.24	.20	.24
Diglycol Laurate, bbls lb.	...	.16	...	.16	.16	.21
Oleate, bbls lb.	...	.17	...	.17	.13	.17
Stearate, bbls lb.	...	.22	...	.22	.22	.26
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis lb.	1.00	1.05	1.00	1.05	1.00	1.05
Dimethylaniline, 240 lb drs lb.	.23	.24	.23	.24	.23	.24

* These prices were on a delivered basis.

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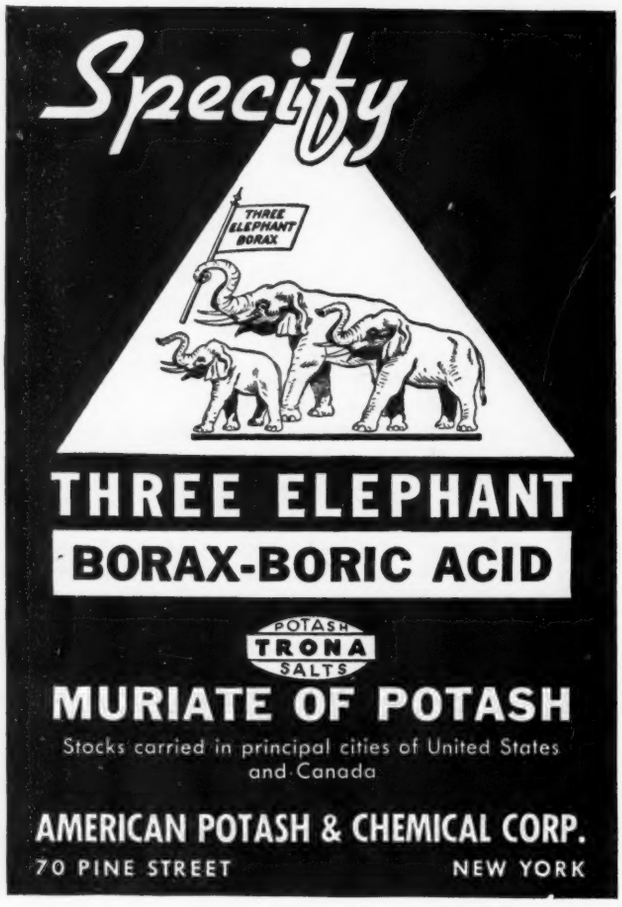
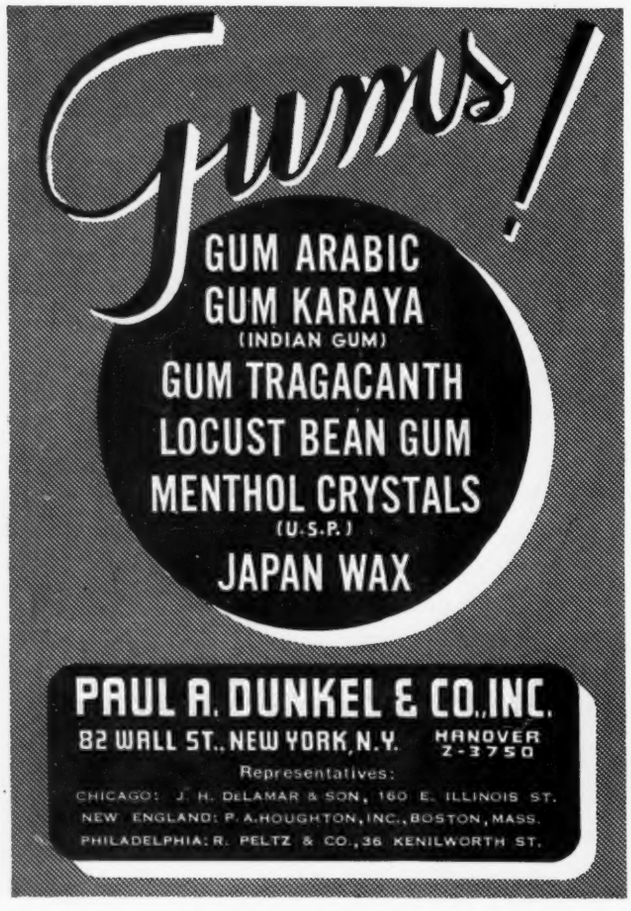




Dimethyl Phthalate
Glue, Bone

Prices

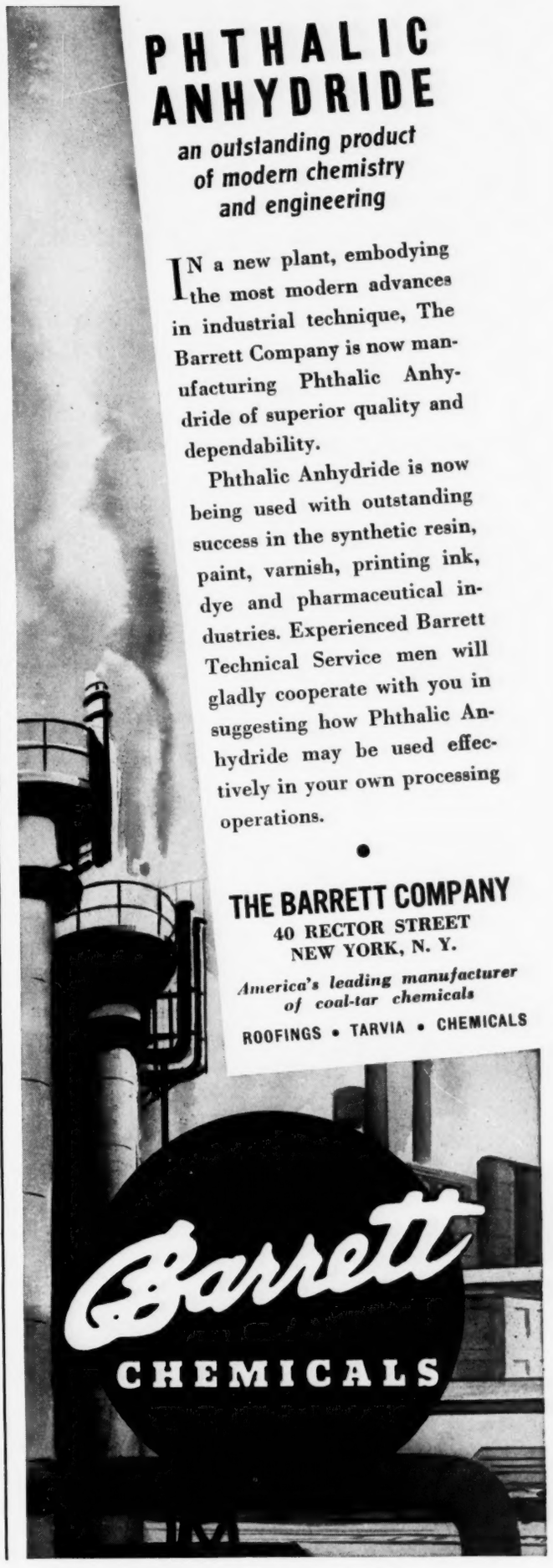
	Current Market		1941 Low	1941 High	1940 Low	1940 High
Dimethyl phthalate, drs, wks, frt all'd	lb.	...	.18½	...	.18½	...	.18½
Dimethylsulfate, 100 lb drs	lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls	lb.	...	.18	...	.18	.18	.19
Dinitrochlorobenzene, 400 lb bbls	lb.	...	.14	...	.14	...	.14
Dinitronaphthalene, 350 lb bbls	lb.	.35	.38	.35	.38	.35	.38
Dinitrophenol, 350 lb bbls	lb.	...	22	...	.22	.22	.23
Dinitrotoluene, 300 lb bbls	lb.	...	.15½	...	.15½	...	.15½
Diphenyl, bbls	lb.	.15	...	.15	.20	.15	.20
Diphenylamine	lb.	...	.25	...	.25	.25	.32
Diphenylguanidine, 100 lb drs	lb.	.35	.37	.35	.37	.35	.37
Dip Oil, see Tar Acid Oil.							
Divi Divi pods, bgs shipmt	ton	...	35.00	32.00	35.00	...	nom.
Extract	lb.	.05¾	.06¾	.05¾	.06¾	.05¾	.06¾
Drymet (see sodium metasilicate anhydrous).							
Egg Yolk, dom., 200 lb. cases	lb.	.72	.75	.60	.75	.57	.62
Epsom Salt, tech, 300 lb bbls c-l, NY	100 lb.	...	1.90	...	1.90	1.90	2.10
USP, c-l, bbls	100 lb.	...	2.10	...	2.10	...	2.10
Ether, USP anaesthesia 55 lb drs	lb.	...	.26	...	.26	...	.26
Isopropyl 50 gal drs	lb.	.07	.08	.07	.08	.07	.08
tks, frt all'd	lb.	...	.06	...	.06	...	.06
Nitrous conc bottles	lb.	...	.73	...	.73	...	.68
Synthetic, wks, tks	lb.	.08	.09	.08	.09	.08	.09
Ethyl Acetate, 85% Ester tks, frt all'd	lb.	...	.06½	...	.06½	.06	.06½
drs, frt all'd	lb.	...	.07½	...	.07½	.07	.08½
99%, tks, frt all'd	lb.	...	.06¾	...	.06¾	.06¼	.08
drs, frt all'd	lb.	...	.07¾	...	.07¾	.07¼	.08¾
Acetoacetate, 110 gal drs	lb.	...	.27½	...	.27½	...	.27½
Benzylaniline, 300 lb drs	lb.	.86	.88	.86	.88	.86	.88
Bromide, tech drs	lb.	.50	.55	.50	.55	.50	.55
Cellulose, drs, wks, frt all'd	lb.	.45	...	.45	.50	.45	.50
Chloride, 200 lb drs	lb.	.18	.20	.18	.20	.18	.20
Chlorocarbonate, cbys	lb.	...	.30	...	.30	...	.30
Crotonate, drs	lb.	...	.35	...	.35	...	.35
Formate, drs, frt all'd	lb.	.25	.26	.25	.26	.23	.24
Lactate, drs, wks	lb.	...	.33½	...	.33½	...	.33½
Oxalate, drs, wks	lb.	...	.25	...	.25	...	.25
Oxybutyrate, 50 gal drs, wks	lb.	1.00	nom.	1.00	nom.	.30	1.00
Silicate, drs, wks	lb.	...	.77	...	.77	...	.77
Ethylene Dibromide, 60 lb drs	lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont	lb.	.75	.85	.75	.85	.75	.85
Anhydrous	lb.	...	.75	...	.75	..	.75
Dichloride, 50 gal drs, E. Rockies	lb.	.0693	.0742	.0693	.0746	.0595	.0694
Glycol, 50 gal drs, wks	lb.	.14½	.18½	.14½	.18½	.14½	.18½
tks, wks	ib.	...	.13½	...	.13½	...	.13½
Mono Butyl Ether, drs, wks	lb.	.16½	.17½	.16½	.17½	.16½	.21
tks, wks	lb.	...	.15½	...	.15½	...	.15½
Mono Ethyl Ether, drs wks	lb.	.14½	.15½	.14½	.15½	.14½	.15½
tks, wks	lb.	...	.13½	...	.13½	...	.13½
Mono Ethyl Ether Acetate, drs, wks	lb.	.11½	.12½	.11½	.12½	.11½	.13
tks, wks	lb.	...	.10½	...	.10½	...	.10½
Mono Methyl Ether, drs wks	lb.	.15½	.16½	.15½	.16½	.15½	.17
tks, wks	lb.	...	.14½	...	.14½	...	.14½
Oxide, cyl	lb.	.45	.47½	.45	.47½	.45	.47½
Ethylideneaniline	lb.	17.00	19.00	17.00	19.00	17.00	19.00
Feldspar, blk pottery	ton	14.00	17.50	14.00	17.50	14.00	17.50
Powd, blk wks	ton						
Ferric Chloride, tech, crys, 475 lb bbls	lb.	.05	.07½	.05	.07½	.05	.07½
sol, 42° cbys	lb.	.06½	.07	.06½	.07	.06¼	.07
Fish Scrap, dried, unground wks	unit *l*	4.40	...	...	...	3.10	4.25
Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis	unit *m*	...	2.75	no prices		2.25	3.50
Fluorspar, 98% bgs	ton	...	29.00	...	29.00	29.00	32.00
Formaldehyde, USP, 400 lb bbls, wks	lb.	.055	.06	.055	.06	.05¾	.06¼
Fossil Flour	lb.	.02½	.04	.02½	.04	.02½	.04
Fullers Earth, blk, mines	ton	...	15.00	...	15.00	...	15.00
Imp powd, c-l, bgs	ton	no prices		no prices		...	25.00
Furfural (tech) drs, wks	lb.	...	.15	.10	.15	.10	.15
tks, wks	lb.	...	.09	...	.09	...	...
Furfuramide (tech) 100 lb drs	lb.	...	.30	...	.30	...	.30
Fusel Oil, 10% impurities	lb.	.16	.17½	.16	.17½	.16	.17¼
Fustic, crystals, 100 lb boxes	lb.	.24	.25	.24	.25	.24	.28
Liquid 50°, 600 lb bbls	lb.	.10½	.14	.10½	.14	.10½	.14
Solid, 50 lb boxes	lb.	.19	.21	.19	.21	.19	.21
G Salt paste, 360 lb bbls	lb.	...	.45	...	.45	.45	.47
Gambier, com 200 lb bgs	lb.	nom.	.09	.06½	.09	.06½	.07
Singapore cubes, 150 lb bgs	100 lb.	.10½	nom.	.08¼	.10½	.08¼	.10
Glauber's Salt, tech, c-l, bgs, wks*	100 lb.	.95	1.18	.95	1.18	.95	1.18
Anhydrous, see Sodium Sulfate							
Glue, bone, com grades, c-l bgs	lb.	.15½	.18	.13½	.18	.13½	.15½
Better grades, c-l, bgs	lb.	.18	.29	.15	.29	.15	.23

l + 10; *m* + 50; * Bbls. are 20c higher.

Current

Glycerin, CP
Hydrogen Peroxide

		Current Market	1941 Low	1941 High	1940 Low	1940 High
Glycerin, CP, 550 lb drs	lb.	...	.14½	... .14½	...	.12½
Dynamite, 100 lb drs	lb.	... nom.	...	nom.	...	nom.
Saponification, drs	lb.	...	.11½	.09½ .11½	.09½	.13
Soap Lye, drs	lb.	nom.	.09	.07⅞ .09	.07⅞	.08¼
Glyceryl Bori-Borate, bbls	lb.	...	.40	... .40	...	.40
Monoricinoleate, bbls	lb.	...	.27	... .27	...	.27
Monostearate, bbls	lb.	...	.30	... .30	...	.30
Oleate, bbls	lb.	...	.22	... .22	...	.22
Phthalate	lb.	...	.38	... .38	.37	.38
Glyceryl Stearate, bbls	lb.	...	.18	... .18	...	.18
Glycol Bori-Borate, bbls	lb.	...	.22	... .22	...	.22
Phthalate, drs	lb.	...	.38	... .38	...	.38
Stearate, drs	lb.	...	.26	... .26	...	.26
GUMS						
Gum Aloes, Barbadoes	lb.	.85	.90	.80 .95	.80	.90
Arabic, amber sorts	lb.	.18	.19	.14 .19	.08½	.15
White sorts, No. 1, bgs	lb.	.35	.36	.35 .36	.28	.36
No. 2, bgs	lb.	no prices		no prices	.27	.34
Powd, bbls	lb.	.21	.22	.18 .22	.12½	.20
Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b. NY	lb.	.04½	.05½	.04½ .05½	.02½	.10½
California, f.o.b. NY, drs	ton	29.00	36.50	29.00 36.50	29.00	36.50
Egyptian, 200 lb cases, f.o.b. NY	lb.	.12	.15	.12 .15	.12	.15
Benzoin Sumatra, USP, 120 lb cases	lb.	.23	.24	.19 .20	.17	.24
Copal, Congo, 112 lb bgs, clean, opaque	lb.	...	.49½	... .49½	...	.49½
Dark amber	lb.	...	.12⅜	... .12⅜	.11⅜	.12⅜
Light amber	lb.	...	.17	... .17	...	.17
Copal, East India, 180 lb bgs						
Macassar pale bold	lb.	...	.12¾	... .12¾	.12¾	.15⅝
Chips	lb.	...	.06¾	... .06¾	.06¾	.09
Dust	lb.	...	.05¼	... .05¼	.04¾	.06¾
Nubs	lb.	...	.10½	... .10½	.10½	.14⅜
Singapore, Bold	lb.	...	.15¾	... .15¾	.14⅝	.17½
Chips	lb.	...	.08½	... .08½	.08½	.09⅜
Dust	lb.	...	.05¼	... .05¼	.04¾	.06¾
Nubs	lb.	...	.11	... .11	.11	.13½
Copal Manila, 180-190 lb		...	.13⅜	... .13⅜	.13¾	.16¾
Loba B	lb.	...	.11¾	... .11¾	.11¾	.16⅛
Loba C	lb.	...	.11¼	... .11¼	.11¼	.14½
DBB	lb.	...	.10	... .10	.06⅞	.12⅛
MA sorts	lb.	...	.07¾	... .07¾	.07¾	.13¾
Copal Pontianak, 224 lb cases, bold genuine	lb.	...	.15⅜	... .15⅜	.15⅜	.18½
Chips	lb.	...	.10	... .10	.08⅜	.10½
Mixed	lb.	...	.14⅜	... .14⅜	.14⅛	.16⅝
Nubs	lb.	...	.12¾	... .12¾	.10¾	.13½
Split	lb.	...	.13¾	... .13¾	.13½	.16⅛
Damar Batavia, 136 lb cases						
A	lb.	...	.21⅝	... .21⅝	.21⅝	.22¾
B	lb.	...	.20¼	... .20¼	.20⅛	.21⅛
C	lb.	...	.14⅜	... .14⅜	.15⅛	.15¼
D	lb.	...	.13¼	... .13¼	.13¼	.13¾
A/D	lb.	...	.15¼	... .15¼	.13⅞	.14½
A/E	lb.	...	.12⅞	... .12⅞	.12⅞	.13⅜
E	lb.	...	.10	... .10	.10	.10⅜
F	lb.	...	.08	... .08	.08	.08¾
Singapore, No. 1	lb.	...	.16⅝	... .16⅝	.16⅛	.19⅜
No. 2	lb.	...	.12¼	... .12¼	.12¼	.15¾
No. 3	lb.	...	.07⅛	... .07⅛	.07⅛	.09
Chips	lb.	...	.11	... .11	.11	.12½
Dust	lb.	...	.07⅛	... .07⅛	.07⅛	.09
Seeds	lb.	...	.09⅞	... .09⅞	.09⅞	.10½
Elemi, cns, c-l	lb.	...	.08½	... .08½	.10⅛	.11⅜
Ester	lb.	.06¼	.06¾	.06¼ .06¾	.06¼	.06¾
Gamboge, pipe, cases	lb.	.95	1.00	.95 1.00	.70	.75
Powd, bbls	lb.	1.05	1.10	1.05 1.10	.75	.80
Ghatti, sol, bgs	lb.	.11	.15	.11 .15	.11	.15
Karaya, bbls, bxs, drs	lb.	.14	.33	.14 .33	.14	.33
Kauri, NY						
Brown XXX, cases	lb.	...	.60	... .60	...	.60
BX	lb.	...	.38	... .38	...	.38
B1	lb.	...	.28	... .28	...	.28
B2	lb.	...	.24	... .24	...	.24
B3	lb.	...	.18½	... .18½	...	.18½
Pale XXX	lb.	...	.61	... .61	...	.61
No. 1	lb.	...	.41	... .41	...	.41
No. 2	lb.	...	.24	... .24	...	.24
No. 3	lb.	...	.17¾	... .17¾	...	.17¾
Kino, tins	lb.	no prices		no prices	2.00	4.50
Mastic	lb.	1.50	1.65	1.50 1.65	.85	2.50
Sandarac, prime quality, 200 lb bgs & 300 lb cks	lb.	.52½	.55	.50 .55	.35	.37
Senegal, picked bags	lb.	...	.30	... .30	...	.30
Sorts	lb.	...	.13	... .13	...	.13
Thus, bbls	280 lbs.	15.00	15.25	15.00 15.25	15.00	15.25
Tragacanth, No. 1, cases	lb.	3.00	3.10	2.75 3.10	2.65	3.50
No. 2	lb.	2.70	2.80	2.45 2.80	2.55	3.35
No. 3	lb.	2.50	2.60	2.10 2.60	2.45	2.90
Yacca, bgs	lb.	.03½	.04	.03½ .04	.03½	.04
Hematine crystals, 400 lb bbls	lb.	.20	.30	.20 .30	.20	.30
Hemlock, 25%, 600 lb bbls. wks	lb.	...	.03⅛	... .03⅛	.03⅛	.03⅜
tks	lb.	...	.02¾	... .02¾	.02¾	.03
Hexalene, 50 gal drs, wks	lb.	...	.30	... .30	...	.30
Hexane, normal 60-70° C. Group 3, tks	gal.	...	.09¾	... .09¾	...	.10½
Hexamethylenetetramine, powd, drs	lb.	.32	.33	.32 .33	.32	.33
Hexyl Acetate, secondary, delv, drs	lb.	.13	.13½	.13 .13½	.13	.13½
tks	lb.	...	.12	... .12	...	.12
Hoof Meal, f.o.b. Chicago unit		2.70	2.75	2.65 2.80	2.00	3.15
Hydrogen Peroxide, 100 vol, 140 lb cbys	lb.	.16	.18½	.16 .18½	.16½	.20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Hydroxylamine Hydrochloride
Methanol

Prices

		Current Market	1941 Low	1941 High	1940 Low	1940 High
Hydroxylamine Hydrochloride	lb.	...	3.15	...	3.15	...	3.15
Hypernic, 51°, 600 lb bbls	lb.	...	14	...	.14	...	.14
Indigo, Bengal, bbls	lb.	1.63	1.67	1.63	1.67	1.63	1.67
Synthetic, liquid	lb.	.16½	.19	.16½	.19	.16½	.19
Iodine, Resublimed, jars	lb.	...	2.00	...	2.00	1.75	2.50
Irish Moss, ord, bales	lb.	.25	.28	.25	.28	.15	.28
Bleached, prime, bales	lb.	.32	.35	.32	.35	.28	.35
Iron Acetate Liq. 17°, bbls delv	lb.	.03	.04	.03	.04	.03	.04
Chloride see Ferric Chloride.							
Nitrate, coml, bbls. 100	lb.	3.50	4.00	3.50	4.00	2.75	4.00
Isobutyl Carbinol (128-132° C) drs, frt all'd	lb.	...	.23½	.22½	.23½	.22½	.34
tks, frt all'd	lb.	...	.21½	...	.21½	.21½	.32
Isopropyl Acetate, tks, frt all'd	lb.	...	.06½	...	.06½	.05½	.06½
drs, frt all'd	lb.	.07½	.08	.07½	.08	.06½	.07½
Ether, see Ether, isopropyl.							
Keiselguhr, dom bags, c-l, Pacific Coast	ton	22.00	25.00	22.00	25.00	22.00	35.00
Lead Acetate, f.o.b. NY, bbls, White, broken	lb.	...	.11	...	.11	...	.11
cryst, bbls	lb.	...	.11	...	.11	...	.11
gran bbls	lb.	...	.11¼	...	.11¼	...	.11¼
powd, bbls	lb.	...	.11¼	...	.11¼	...	.11¼
Arsenate, East, drs	lb.	.09	.09½	.09	.09½	.08½	.11
Linoleate, solid, bbls	lb.	...	.19	...	.19		.19
Metal, c-l, NY 100	lb.	...	5.70	...	5.70	4.90	5.70
Nitrate, 500 lb bbls, wks	lb.	.11	14	.11	.14	.11	.14
Oleate, bbls	lb.	.18½	.20	.18½	.20	.18½	.20
Red, dry, 95% Pb_3O_4, delv	lb.	...	.08¾	.08	.08¾	.07½	.0815
97% Pb_3O_4, delv	lb.	...	.086	.084	.086	.0765	.0848
98% Pb_3O_4, delv	lb.	.0885	.0865	.0865	0885	.08	.0865
Resinate, precip, bbls	lb.	...	.16½	...	.16½	...	.16½
Stearate, bbls	lb.	...	.25	...	.25	...	.26
Titanate, bbls, c-l, f.o.b. wks, frt all'd	lb.	...	.10¼	...	.10¼	.10	.10¼
White, 500 lb bbls, wks, lb.		...	.07½	...	.07½	.07	.07½
Basic sulfate, 500 lb bbls, wks	lb.	...	.06½	...	.06½	.06¼	.06½
Lime, chemical quicklime, f.o.b. wks, bulk	ton	7.00	13.00	7.00	13.00	7.00	13.00
Hydrated, f.o.b. wks	ton	8.50	16.00	8.50	16.00	8.50	16.00
Lime Salts, see Calcium Salts							
Lime, sulfur, dealers, tks	gal.	...	.07½	...	.07½	.07½	.11½
drs	gal.	.10	.14	.10	.14	.11	.16
Linseed Meal, bgs	ton	23.00	23.50	23.00	25.00	23.50	37.00
Litharge, coml, delv, bbls	lb.	...	.0760	.07	.0760	.06½	.07½
Lithopone, dom, ordinary, delv, bgs	lb.	...	.0385	...	.0385	...	.036
bbls	lb.	...	.0410	...	.0410	.03¾	.03¾
Titanated, bgs	lb.	...	.05¼	...	.05¼	...	.05¼
bbls	lb.	...	.05½	...	.05½	...	.05½
Logwood, 51°, 600 lb bbls	lb.	.10½	.12½	.10½	.12½	.10½	.12½
Solid, 50 lb boxes	lb.	.16½	.20½	.16½	.20½	.16½	.20½
Madder, Dutch	lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbls	ton	67.00	75.00	65.00	75.00	58.00	70.00
Magnesium Carb, tech, 70 lb bgs, wks	lb.	...	.06¼	...	.06¼	...	.06¼
Chloride flake, 375 lb bbls, c-l, wks	ton	...	32.00	...	32.00	32.00	42.00
Fluosilicate, crys, 400 lb bbls, wks	lb.	.11	.11¼	.10	.11¼	.10	.10½
Oxide, calc tech, heavy bbls, frt all'd	lb.	...	.26	...	.26	.25	.30
Light bbls above basis	lb.	...	.26	...	.26	.20	.26
USP Heavy, bbls, above basis	lb.	...	.26	...	.26	.25	.30
Palmitate, bbls	lb.	.33	nom.	.33	nom.	.33	nom.
Silicofluoride, bbls	lb.	.11	.11¼	.11	.11½	.11	.11½
Stearate, bbls	lb.	.23	.26	.23	.26	.23	.27
Manganese, acetate, drs	lb.	...	.26½	...	.26¼	...	.26½
Borate, 30%, 200 lb bbls	lb.	.15	16	.15	.16	.15	.16
Chloride, bbls	lb.	...	.14	...	...	...	...
Dioxide, tech (peroxide), paper bgs, c-l	ton	...	71.50	...	71.50	62.50	70.00
Hydrate, bbls	lb.	...	.82	...	.82	...	.82
Linoleate, liq, drs	lb.	.18	.19½	.18	.19½	.18	.19½
solid, precip, bbls	lb.	...	19	...	.19	...	.19
Resinate, fused, bbls	lb.	.08¼	.08½	.08¼	.08½	.08¼	.08½
precip, drs	lb.	...	.12	...	.12	...	.12
Sulfate, tech, anhyd, 90-95%, 550 lb drs	lb.	.10½	.10¾	.10½	.10¾	.08	.09¾
Mangrove, 55%, 400 lb bbls	lb.	...	.85	.85	.90	.90	1.00
Bark, African	ton	36.00	nom.	34.00	36.00	30.00	39.50
Mannitol, pure cryst, cs, wks	lb.	...	.85	.85	.90	.90	1.00
commercial grd, 250 lb bbls	lb.	.35	.40	.35	.45	.38	.50
Marble Flour, blk	ton	12.00	14.00	12.00	14.00	12.00	14.00
Mercury chloride (Calomel)	lb.	...	2.70	...	2.70	2.45	2.95
Mercury metal .76 lb. flasks		...	185.00	167.00	185.00	163.00	228.50
Mesityl Oxide, f.o.b. dest., tks	lb.	...	.10½	.10½	.15	...	.15
drs, c-l	lb.	...	.11½	.11½	.16	..	.16
drs, lcl	lb.	...	.12	.12	.16½	...	.16½
Meta-nitro-aniline	lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200 lb bbls	lb.	1.05	1.10	1.05	1.10	1.05	1.40
Meta-phenylene diamine 300 lb bbls	lb.	...	.65	...	.65	...	.65
Meta-toluene-diamine 300 lb bbls	lb.	...	.65	...	.65	.65	.67
Methanol, denat, grd, drs, c-l frt all'd	gal.	...	.45	...	.45	...	.45
tks, frt all'd	gal.	...	.40	...	.40	...	.40

	Current Market	1941 Low	1941 High	1940 Low	1940 High
Methanol (continued):					
Pure, drs, c-l, frt all'd gal.	...	.35½	...	.35½	.35	.38
tks gal.	...	.30	...	.30	.30	.33
95%, tks gal.	...	.29	...	.29	.28	.31
97%, tks gal.	...	.30	...	.30	.29	.32
Methyl Acetate, tech tks, delv lb.	.06	.07	.06	.07	.06	.07
55 gal drs, delv lb.	.07	.08	.07	.08	.07	.08
C.P. 97-99%, tks, delv lb.	.09½	.10½	.09½	.10½	.09½	.10½
55 gal drs, delv lb.	.10½	.11½	.10½	.11½	.10½	.11½
Acetone, frt all'd, drs gal. *p*	...	.37½	...	.37½	.41	.44
tks, frt all'd gal. *p*	...	.32	...	.32	.35	.39
Synthetic, frt all'd, east of Rocky M., drs gal. *p*	...	.37½	...	.37½	.36	.44
tks, frt all'd gal.	...	.32	...	.32	.32	.36
West of Rocky M., frt all'd, drs gal *p*	...	.41½	...	.41½	.41½	.48
tks, frt all'd gal. *p*	...	.35	...	.35	.35	.45½
Anthraquinone lb.	...	.83	...	.83	...	.83
Butyl Ketone, tks lb.	...	.10½	...	.10½	...	.10½
Cellulose, 100 lb lots, frt all'd lb.	...	.55	...	.55	.55	.70
less than 100 lbs. f.o.b. wks lb.	...	.60	...	.60	.60	.75
Chloride, 90 lb. cyl lb.	.32	.40	.32	.40	.32	.40
Ethyl Ketone, tks, frt all'd lb.	...	.07½	.06	.07½	.05½	.06
50 gal drs, frt all'd, c-l lb.	...	.08½	.07	.08½	.06½	.07½
Formate, drs, frt all'd lb.	...	.89	...	.89	...	.89
Hexyl, Ketone, pure, drs lb.	...	.60	...	.60	...	.60
Lactate, drs, frt all'd lb.	...	.80	...	.80	...	.80
Mica, dry grd, bgs, wks ton	...	30.00	...	30.00	...	30.00
Michler's Ketone, kgs lb.	...	2.50	...	2.50	...	2.50
Mixed Amylnaphthalenes mixed, ref., l-c-l, drs, f.o.b. wks lb.	...	.16	.16	.19	...	...
crude lb.	...	.14	.14	.15	...	...
Monoamylamine, c-l, drs, wks lb.	...	.50	.50	.52	...	.52
lcl, drs, wks lb.	...	.53	...	.55	...	.55
Monoamylnaphthalene, l-c-l, drs, f.o.b. wks lb.	...	.17	.17	.20	...	...
Monobutylamine, drs, c-l, wks lb.	...	.50	...	.50	...	.50
lcl, wks lb.	...	.40	...	.53	...	.53
tks, wks lb.	...	.48	...	.48	...	.48
Monochlorobenzene, see "C"						
Monoethanolamine, tks, wks, lb.	...	.23	...	.23	...	.23
Monoethylamine (100% basis) lcl, drs, f.o.b. wks lb.	...	.35	.35	.65	...	.65
Monomethylamine, drs, frt all'd, E. Mississippi, c-l lb.	...	.65	...	.65	...	.65
Monomethylparamiosulfate, 100 lb drs lb.	3.75	4.00	3.75	4.00	3.75	4.00
Morpholine, drs 55 gal, wks lb.	...	.67	...	.67	...	.75
Myrobalans 25%, liq bbls lb.	no prices		no prices		no prices	
50% Solid, 50 lb boxes lb.	no prices		no prices		no prices	
J1 bgs ton	no prices	35.00	48.00	28.50	40.00	
J2 bgs ton	no prices	28.00	39.00	23.00	34.00	
Naphtha, v.m.&p. (deodorized) see petroleum solvents.						
Naphtha, Solvent, water-white, tks gal.	...	.26	...	.26	.26	.27
drs, c-l gal.	...	.31	...	.31	.31	.32
Naphthalene, dom, crude bgs, wks lb. *q*	2.25	2.50	2.25	2.50	2.25	2.75
imported, cif, bgs lb.	no prices		no prices		...	3.00
Balls, flakes, pks lb.	.06¼	.07¾	.06¼	.07¾	.06¼	.07¾
Balls, ref'd bbls, wks lb.	...	.07	...	.07	.06¾	.07
Flakes, re'd, bbls, wks lb.	...	.07	...	.07	.06¾	.07
Nickel Carbonate, bbls lb.	.36	.36½	.36	.36½	.36	.36½
Chloride, bbls lb.	.18	.20	.18	.20	.18	.20
Metal ingot lb.	.35	.36	.34	.36	.34	.35
Oxide, 100 lb kgs, NY lb.	.35	.38	.35	.38	.35	.38
Salt, 400 lb bbls, NY lb.	.13	.13½	.13	.13½	.13	.13½
Nicotine, sulfate, 40%, drs, 55 lb drs lb.	...	.703	...	.703	...	.70
Nitre Cake, blk ton	...	16.00	...	16.00	...	16.00
Nitrobenzene redistilled, 1000 lb drs, wks lb.	.08	.09	.08	.09	.08	.10
tks lb.	...	.07	...	.07	...	.07
Nitrocellulose, c-l, lcl, wks lb.	.20	.29	.20	.29	.20	.29
Nitrogen Sol. 45½% ammon, f.o.b. Atlantic & Gulf ports, tks, unit ton, N basis	...	1.2158	...	1.2158	...	1.2158
Nitrogenous Mat'l, bgs imp unit	no prices		no prices		2.20	2.60
dom, Eastern wks unit	...	2.20	...	2.20	2.20	2.90
dom, Western wks unit	...	2.00	1.75	2.00	1.95	2.00
Nitronaphthalene, 550 lb bbls lb.	.24	.25	.24	.25	.24	.25
Nutgalls Alleppo, bgs lb.	.26	.29	.26	.29	.28	.30
Oak Bark Extract, 25%, bbls lb.	.03⅛	.03⅜	.03⅛	.03⅜	.03⅛	.03⅜
tks lb.	...	.02¾	...	.02¾	...	.02¾
Octyl Acetate, tks, wks lb.	...	.15	...	.15	...	.15
Orange-Mineral, 1100 lb cks NY lb.	...	.11½	.11	.11½	.10½	.13½
Orthoaminophenol, 50 lb kgs lb.	2.15	2.25	2.15	2.25	2.15	2.25
Ortho amyl phenol, l-c-l, drs, f.o.b. wks lb.	...	.15	...	.15	...	...
Orthoanisidine, 100 lb drs lb.	...	.70	...	.70	.70	.74
Orthochlorophenol, drs lb.	...	.32	...	.32	...	.32
Orthocresol, 30.4°, drs, wks lb.	.16	.16½	.16	.16½	.16	.16½
Orthodichlorobenzene, 1000 lb drs lb.	...	.07	.06	.07	.06	.07
Orthonitrochlorobenzene, 1200 lb drs, wks lb.	.15	.18	.15	.18	.15	.18

a Country is divided in 4 zones, prices varying by zone; *p* Country is divided into 4 zones. Also see footnote directly above; *q* Naphthalene quoted on Pacific Coast F.A.S. Phila., or N. Y.

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Orthonitroparachlorphenol
Pitch, Coaltar

Prices

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Orthonitroparachlorphenol, tins	lb.	...	.75	...	.75	...	.75
Orthonitrophenol, 350 lb drs	lb.	.85	.90	.85	.90	.85	.90
Orthonitrotoluene, 1000 lb drs, wks	lb.	...	.09	...	.09	...	.09
Orthotoluidine, 350 lb bbls, lcl	lb.	...	.19	...	.19	...	.19
Osage Orange, cryst, bbls	lb.	...	.21	...	.21	...	.21
51° liquid	lb.	...	.10	...	.10	...	.10
Paraffin, rfd, 200 lb bgs 122-127° M P	lb.	...	.057	...	.057	.02¼	.0675
128-132° M P	lb.	.057	.0595	.057	.0595	.057	.0705
133-137° M P	lb.	.06¼	.06½	.06¼	.06½	.06¼	.0755
Para aldehyde, 99%, tech, 110-55 gal drs, wks	lb.	.10	.11¼	.10	.11¼	.10	.11¼
Aminoacetanilid, 100 lb kgs	lb.	...	.85	...	.85	...	.85
Aminohydrochloride, 100 lb kgs	lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs	lb.	...	1.05	...	1.05	...	1.05
Chlorophenol, drs	lb.	...	.32	...	.32	...	.32
Dichlorobenzene 200 lb drs, wks	lb.	.11	.12	.11	.12	.11	.12
Formaldehyde, drs, wks	lb.	.23	.24	.23	.24	.34	.35
Nitroacetanilid, 300 lb bbls	lb	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wks	lb.	...	.45	...	.45	.45	.47
Nitrochlorobenzene, 1200 lb drs, wks	lb.	...	.15	...	.15	.15	.16
Nitro-orthotoluidine, 300 lb bbls	lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls	lb.	...	.35	...	.35	.35	.37
Nitrosodimethylaniline, 120 lb bbls	lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls	lb.	...	.30	...	.30	...	.30
Phenylenediamine, 350 lb bbls	lb.	1.25	1.30	1.25	1.30	1.25	1.30
Toluenesulfonamide, 175 lb bbls	lb.	...	.70	...	.70	.70	.75
tks, wks	lb.	...	.31	...	.31	...	.31
Toluenesulfonchloride, 410 lb bbls, wks	lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks	lb.	...	.48	...	.48	.48	.50
Paris Green, dealers, drs	lb.	.23	.25	.23	.25	.23	.26
Pentane, normal, 28-38° C, group, 3 tks	gal.	...	.08½	...	.08½	...	.08½
drs, group 3	gal.	.11½	.16	.11½	.16	.11½	.16
Perchlorethylene, 10 lb drs, frt all'd	lb.	.08	.08½	.08	.08½	.08	.08¼
Petrolatum, dark amber, bbls	lb.	...	.03¼	.02¾	.03¼	.02¾	.05
White, lily, bbls	lb.	...	.04¾	...	.04¾	.04¾	.08½
White, snow, bbls	lb.	...	.05¼	...	.05½	.05½	.09½
Petroleum Ether, 30-60°, group 3, tks	gal.	...	.13½	...	.13½	...	.13½
drs, group 3	gal.	...	.14½	...	.14½	.14½	.25½

PETROLEUM SOLVENTS AND DILUENTS

Cleaners naphthas, group 3, tks, wks	gal.	.06¾	...	.06¾	.07	.06⅞	.07
East Coast, tks, wks	gal.	.09½	...	.09	.10½	.09	.10½
Lacquer diluents, tks East Coast	gal.	...	.10	.09½	.10	.09½	.10
Group 3, tks	gal.	.06⅝	.07¾	.06¼	.07¾	.07⅜	.07⅞
Naphtha, V.M.P., East tks, wks	gal.	.09½	...	.09	.09½	.09½	.10
Group 3, tks, wks	gal.	.06¾	...	.06	.07	.06⅜	.07⅞
Petroleum thinner, 43-47, East, tks, wks	gal.	.08¾	.09½	.08¾	.09½	.08¾	.09½
Group 3, tks, wks	gal.	.06	.07	.05⅞	.07	.05⅞	.07
Rubber Solvents, stand grd, East, tks, wks	gal.	...	.09½	...	.09½	.09½	.10
Group 3, tks, wks	gal.	.06	.07	.06	.07	.06⅜	.07⅞
Stoddard Solvents, East, tks, wks	gal.	.083	.09½	.083	.09½	.08¾	.09½
Group 3, wks	gal.	.05½	.06½	.05½	.06½	.06⅜	.06½
Phenol, 250-100 lb drs	lb.	.12	.13¾	.12	.13¾	.12	.14¾
tks, wks	lb.	...	.11	...	.11	.11	.12
Phenyl-Alpha-Naphthylamine, 100 lb kgs	lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drs	lb.	...	.17	...	.17	...	.17
Phenylhydrazine Hydrochloride, com	lb.	...	1.50	...	1.50	...	1.50
Phloroglucinol, tech, tins	lb.	15.00	16.50	15.00	16.50	15.00	16.50
CP, tons	lb.	20.00	22.00	20.00	22.00	20.00	22.00
Phosphate Rock, f.o.b. mines 70% basis	ton	...	2.15	...	2.15	1.85	1.90
72% basis	ton	...	2.50	...	2.50	2.15	2.35
Florida Pebble, 68% basis	ton	...	1.90	...	1.90	1.90	2.85
75-74% basis	ton	...	2.90	...	2.90	2.90	3.85
Tennessee, 72% basis	ton	...	4.50	...	4.50	...	4.50
Phosphorus Oxychloride 175 lb cyl	lb.	.15	.18	.15	.18	.15	.20
Red, 110 lb cases	lb.	.40	.44	.40	.44	.40	.44
Sesquisulfide, 100 lb cs	lb.	.38	.42	.38	.42	.38	.44
Trichloride, cyl	lb.	.15	.16	.15	.16	.15	.18
Yellow, 110 lb cs, wks	lb.	.18	.20	.18	.20	.18	.20
Phthalic Anhydride, 100 lb drs, wks	lb.	.14½	.15½	.14½	.15½	.14½	.15½
Pine Oil, 55 gal drs or bbls Destructive dist	lb.	.50	.55	.50	.55	.53	.56
Steam dist wat wh bbls	gal.	...	.59	...	.59	...	.59
tks	gal.	...	.54	...	.54	...	.54
Pitch Hardwood, wks	ton	23.75	24.00	23.75	24.00	23.75	24.00
Coaltar, bbls, wks	ton	19.00	22.00	19.00	22.00	...	19.00

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Pitch (continued)						
Burgundy, dom, bbls, wks	lb.	.06 .06½	.06	.06½	.05½	06½
Imported	lb.	no prices	no prices		no prices	
Petroleum, see Asphaltum in Gums' Section.						
Pine, bbls	bbl.	6.00 6.50	6.00	6.50	6.00	6.50
Polyamylnaphthalene, l-c-l, drs, f.o.b. wks	lb.	... .25	.25	.30	...	...
Potash, Caustic, wks, sol	lb.	.06¼ .06¾	.06¼	.06¾	.06¼	.06¾
flake	lb.	... .07	...	.07	.07	.07½
liquid, tks	lb.	... .02⅞	...	.02⅞	.02⅞	.03¼
Manure Salts, Dom 30% basis, blk	unit	... .60	...	.60	.53½	.58½
Potassium Abietate, bbls	lb.	... .08	...	.08	.08	.09
Acetate, tech, bbls, delv	lb.	... .26	...	.26	...	.26
Bicarbonate, USP, 320 lb bbls	lb.	... .15	.15	.17	...	.18
Bichromate Crystals, 725 lb cks*	lb.	.09 .09¼	.08⅞	.09¼	.08¾	.09¼
Binoxalate, 30 lb bbls	lb.	... .23	...	.23	...	.23
Bisulfate, 100 lb kgs	lb.	.15½ .18	.15½	.18	.15½	.18
Carbonate, 80-85% calc 800 lb cks	lb.	.06½ .06¾	.06½	.06¾	.06½	.07
liquid, tks	lb.	... .0275	...	.0275	.0275	.03
drs, wks	lb.	.03 .03⅛	.03	.03⅛	.03	.03½
Chlorate crys, 112 lb kgs, wks	lb.	nom. .11	...	.11	.10½	.13
gran, kgs	lb.	.12 .14½	.12	.14½	.12	.14½
powd, kgs	lb.	.09½ .10	.09½	.10	.10	.12½
Chloride, crys, bbls	lb.	.08 nom.	.04	.08	.04	.04¾
Chromate, kgs	lb.	.24 .27	.24	.27	.24	.27
Cyanide, drs	lb.	.55	...	.55	.55	.75
Iodide, 250 lb bbls	lb.	1.35 1.38	1.35	1.38	...	1.35
Metabisulfite, 300 lb bbls	lb.	nom. .21	nom.	.21	.13	.19
Muriate, bgs, dom, blk	unit	... .58	.53½	.58	...	.53½
Oxalate, bbls	lb.	.28 .30	.25	.30	.25	.26
Perchlorate, kgs, wks	lb.	.09½ .11	.09½	.11	.09½	.11
Permanganate, USP, crys, 500 & 1000 lb drs, wks	lb.	.19¼ .19¾	.19¼	.20½	.18½	.20½
Prussiate, red, bbls	lb.	no prices	no prices		.38	.45
Yellow, bbls	lb.	.16 .18	.16	.18	.15	.18
Sulfate, 90% basis, bgs	ton	... 36.25	...	36.25	34.25	36.25
Titanium Oxalate, 200 lb bbls	lb.	... .40	...	.40	.40	.45
Pot & Mag Sulfate, 48% basis bgs	ton	... 27.00	...	27.00	24.75	27.00
Propane, group 3, tks	lb.	.03¼ .04	.03¼	.04	.03	.04⅜
Putty, com'l, tubs	100 lb.	... 3.15	...	3.15	...	6.00
Linseed Oil, kgs	100 lb.	... 5.00	...	5.00	...	4.50
Pyrethrum, conc liq: 2.4% pyrethrins, drs, frt all'd	gal.	4.75 4.95	4.75	4.95	4.75	7.50
3.6% pyrethrins, drs, frt all'd	gal.	... 7.20	...	7.20	7.20	11.00
Flowers, coarse, Japan, bgs	lb.	.23 .25	.23	.25	.23	.36
Fine powd, bbls	lb.	.25 .26	.25	.26	.25	.37
Pyridine, denat, 50 gal drs	gal.	... 1.71	...	1.71	...	1.71
Refined, drs	lb.	... .48	...	.48	...	.51
Pyrites, Spanish cif Atlantic ports, blk	unit	no prices	no prices		.12	.13
Pyrocatechin, CP, drs, tins	lb.	2.15 2.40	2.15	2.40	2.15	2.40
Quebracho, 35% liq tks	lb.	... .03¾	...	.03¾	.03¼	.03¾
450 lb bbls, c-l	lb.	... .04¼	...	.04¼	.04	.04¼
Solid, 63%, 100 lb bales cif	lb.	... .04⅞	...	.04⅞	.04½	.04⅞
Clarified, 64% bales	lb.	... .05⅛	...	.05⅛	.04¾	.05⅛
Quercitron, 51 deg liq, 450 lb bbls	lb.	.08½ .09½	.08½	.09½	.08½	.09½
Solid, drs	lb.	.11 .16½	.11	.16½	.10	.16½
R Salt, 250 lb bbls, wks	lb.	... .55	...	.55	...	.55
Resorcinol, tech, cans	lb.	.68 .74	.68	.74	.75	.80
Rochelle Salt, cryst	lb.	.39½ ...	.32½	.39½	.22¼	.29¾
Powd, bbls	lb.	.38½ ...	.31½	.38½	.21¾	.28¾
Rosin Oil, bbls, first run	gal.	... .40	.40	.50	...	.50
Second run	gal.	... .42	.42	.56	.52	.56
Third run, drs	gal.	... .46	.46	.57	.56	.57
Rosins 600 lb bbls, 100 lb unit ex. yard NY:**						
B		... 2.19	2.06	2.19	1.80	2.45
D		... 2.41	2.08	2.41	1.87	2.48
E		... 2.45	2.07	2.45	1.95	2.51
F		... 2.46	2.08	2.46	2.10	2.51
G		... 2.45	2.18	2.45	2.10	2.48
H		... 2.45	2.27	2.45	2.10	2.48
I		... 2.45	2.26	2.45	2.10	2.54
K		... 2.47	2.36	2.65	2.12	2.75
M		... 2.49	2.38	2.65	2.20	2.81
N		... 2.61	2.47	2.81	2.39	2.85
WG		... 2.79	2.79	3.11	2.68	3.17
WW		... 3.05	3.05	3.31	3.00	3.40
X		... 3.10	3.10	3.31	...	...
Rosins, Gum, Savannah (280 lb. unit):**						
B		... 1.56	1.31	1.56	1.15	1.80
D		... 1.65	1.51	1.65	1.22	1.83
E		... 1.67	1.60	1.67	1.30	1.86
F		... 1.67	1.62	1.67	1.45	1.86
G		... 1.67	1.62	1.67	1.45	1.83
H		... 1.68	1.63	1.68	1.45	1.83
I		... 1.71	...	1.71	1.45	1.89
K		... 1.90	1.84	1.90	1.47	2.10
M		... 2.01	2.01	2.10	1.55	2.16

* Spot price is ⅛c higher. ** Jan. 24, 1941, high and low based on 280 lb. unit.

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Prices

	Current Market	1941 Low	1941 High	1940 Low	1940 High
Rosins (continued):					
N	...	2.47	...	2.47	1.70	2.20
WG	...	2.95	...	2.95	2.03	2.52
WW	...	3.25	...	3.25	2.25	2.75
X	...	3.25	...	3.25	2.35	2.75
Rosin, Wood, c-l, FF grade, NY	1.70	2.00	1.40	2.00	1.40	1.54
Rotten Stone, bgs mines ton	25.50	37.50	25.50	37.50	25.50	37.50
Imported, lump, bbls ...lb.	no prices		no prices		...	.14
Powdered, bbls .....lb.	no prices		no prices		.08½	.10
Sago Flour, 150 lb bgs ..lb.	.04½	.05	.03½	.05	.04	.04½
Sal Soda, bbls wks ...100 lb.	...	1.20	...	1.20	...	1.20
Salt Cake, 94-96%, c-l, bulk wks .....ton	...	17.00	...	17.00	...	17.00
Chrome, c-l, wks .....ton	...	16.00	...	16.00	11.00	16.00
Saltpetre, gran, 450-500 lb bbls .....lb.	...	.076	...	.076	.071	.08
Cryst, bbls .....lb.	...	.086	...	.086	.081	.08¾
Powd, bbls .....lb.	...	.086	...	.086	.081	.10
Satin, White, pulp, 550 lb bbls .....lb.	.01¼	.01½	.01¼	.01½	.01¼	.01½
Schaeffer's Salt, kgs .....lb.	...	.46	...	.46	.46	.48
Shellac, Bone dry, bbls ..lb. *s*	.31	.32	.26	.32½	.23	.27
Garnet, bgs .....lb.	.25	.26	.20	.26	.18½	.23
Superfine, bgs .....lb. *s*	.25	.26	.16½	.26	.14½	.20½
T. N., bgs .....lb. *s*	.24½	.25½	.16	.25½	.13½	.19½
Silver Nitrate, vials .....oz.	...	.24	.24	.26⅞	.26¾	.27⅜
Slate Flour, bgs, wks ...ton	9.00	10.00	9.00	10.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks .....100 lb.	...	1.10	...	1.10	...	1.10
58% light, bgs .....100 lb.	1.05	1.08	1.05	1.08	1.05	1.08
blk .....100 lb.	...	.90	...	.90	...	.90
paper bgs .....100 lb.	1.05	1.08	1.05	1.08	1.05	1.08
bbls .....100 lb.	...	1.35	1.35	1.45	1.35	1.45
Caustic, 76% grnd & flake, drs .....100 lb.	...	2.70	...	2.70	...	2.70
76% solid, drs .....100 lb.	...	2.30	...	2.30	...	2.30
Liquid sellers, tks ..100 lb.	...	2.00	...	2.00	1.95	1.97½
SODIUM						
Sodium Abietate, drs .....lb.	...	.11	...	.11	...	.11
Acetate, 60% tech, gran, powd, flake, 450 lb bbls wks .....lb.	.04	.04¼	.04	.05	.04	.05
90%, bbls, 275 lb delv lb.	.06	.06½	.06	.06¾	.06	.06¾
anhyd, drs, delv .....lb.	.08¼	.10	.08¾	.10	.08¼	.10
Alginate, drs .....lb.	.39	.70	.39	.70	.39	.96
Antimoniate, bbls .....lb.	.14	.14½	.14	.14½	.14½	.15
Arsenate, drs .....lb.	.07½	...	.07	.08¾	.07	.08¾
Arsenite, liq, drs .....gal.	...	.35	...	.35	...	.35
Dry, gray, drs, wks ..lb.	.06¼	.06¾	.06½	.09¼	.06½	.09½
Benzoate, USP kgs ....lb.	.46	.50	.46	.50	.46	.52
Bicarb, powd, 400 lb bbl, wks .....100 lb.	...	1.70	...	1.70	1.70	1.85
Bichromate, 500 lb cks, wks* .....lb.	.06⅞	.07½	.06⅞	.07½	.06¼	.07¼
Bisulfite, 500 lb bbls, wks lb.	.03	.031	.03	.031	.03	.031
35-40% sol bbls, wks 100 lb.	1.40	1.80	1.40	1.80	1.30	1.80
Chlorate, bgs, wks .....lb.	...	.06¾	...	.06¼	.06¼	.08½
Cyanide, 96-98%, 100 & 250 lb drs, wks .....lb.	.14	.15	.14	.15	.14	.15
Diacetate, 33-35% acid, bbls, lcl, delv .....lb.	...	.09	...	.09	.08½	.09
Fluoride, white 90%, 300 lb bbls, wks .....lb.	.07	...	.07	.08	.07	.08
Hydrosulfite, 200 lb bbls, f.o.b. wks .....lb.	.17	.18	.17	.18	.16	.17
Hyposulfite, tech, pea crys 375 lb bbls, wks 100 lb.	...	2.80	...	2.80	2.80	3.05
Tech, reg cryst, 375 lb bbls, wks .....100 lb.	2.45	...	2.45	...	2.45	2.80
Iodide, jars .....lb.	...	2.42	...	2.42	2.30	2.42
Metanilate, 150 lb bbls ..lb.	.41	nom.	.41	nom.	.41	.42
Metasilicate, gran, c-l, wks .....100 lb.	...	2.35	...	2.35	...	2.35
cryst, drs, c-l, wks 100 lb.	...	3.05	...	3.05	...	3.05
Anhydrous, wks, cl, drs .....100 lb.	...	3.75	...	3.75	3.75	3.75
wks, lcl, drs, ..100 lb.	5.05	5.05	5.05	5.05	5.05	5.05
Monohydrated, bbls ....lb.	.023	.026	.023	.026	...	.023
Naphthenate, drs .....lb.	.12	.19	.12	.19	.12	.19
Naphthionate, 300 lb bbl lb.	...	.50	...	.50	...	.50
Nitrate, 92% crude, 200 lb. bgs, c-l, NY .....ton	...	28.70	...	28.70	...	28.30
100 bgs, same basis ..ton	...	29.40	...	29.40	...	29.00
Bulk .....ton	...	27.00	...	27.00	...	27.00
Nitrite, 500 lb bbls ....lb.	.06¾	...	.06¾	.11½	.06¾	.11½
Othochlorotoluene, sulfonate, 175 lb bbls, wks lb.	.25	.27	.25	.27	.25	.27
Orthosilicate, 300 lb drs, c-l .....lb.	...	.03	...	.03	...	.03
Perborate, drs, 400 lb ..lb.	.14¾	...	.14¾	.15¼	.14¾	.15¼
Peroxide, bbls, 400 lb ..lb.	...	.17	...	.17	...	.17
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	...	2.40	2.30	2.40	...	2.30
bgs, wks .....100 lb.	...	2.20	2.10	2.20	...	2.10
Tri-sodium, tech, 325 lb bbls, wks .....100 lb.	...	2.55	2.45	2.55	...	2.45
bgs, wks .....100 lb.	...	2.35	2.25	2.35	...	2.25
Picramate, 160 lb kgs ..lb.	...	.65	...	.65	.65	.67
Prussiate, Yellow, 350 lb bbls, wks .....lb.	.10½	...	.10½	.10¾	.09½	.10¾
Pyrophosphate, anhyd, 100 lb bbls f.o.b. wks frt eq lb.	...	.0510	.0510	.0515	...	.0530

r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 2c; Philadelphia deliveries f.o.b. N. Y.; refined 6c higher in each case; *s* T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y.

	Current Market	1941 Low	1941 High	1940 Low	1940 High
Sodium (continued):					
Sesquisilicate, drs, c-l, wks 100 lb.	... 2.90	...	2.90	2.00	2.90
Silicate, 60°, 55 gal drs, wks 100 lb.	no prices	1.40	1.80	1.40	1.80
40°, 55 gal drs, wks 100 lb	... .80	...	.80	...	.80
tks, wks 100 lb.	no prices	...	.65	...	.65
Silicofluoride, 450 lb bbls NY lb.	.10 .12	.09¾	.12	...	...
Stannate, 100 lb drs lb.	.33½ .36½	.32½	.37	.31½	.35½
Stearate, bbls lb.	.19 .24	.19	.24	.19	.24
Sulfanilate, 400 lb bbls lb.	.16 .18	.16	.18	.16	.18
Sulfate, Anhyd, 550 lb bgs c-l, wks 100 lb. †	1.45 1.65	1.45	1.65	1.45	1.90
Sulfide, 80% cryst, 440 lb. bbls, wks lb.	.02¼ ...	.02¼	.03	.02¼	.03
Solid, 650 lb drs, c-l, wks lb.	.03 ...	.03	.03¾	.03	.03¾
Sulfite, powd, 400 lb bbls wks lb.	... .05¼	...	.05¼	.023	.05¼
Sulfocyanide, drs lb.	.28 .47	.28	.47	.28	.47
Sulforicinoleate, bbls lb.	... .12	...	.12	...	.12
Supersilicate (see sodium sesquisilicate)					
Tungstate, tech, crys, kgs lb.	no prices		no prices		no prices
Sorbitol, com, solut, wks c-l, drs, wks lb.	... .14¾	...	.14¾	.14¾	.16
Spruce, Extract, ord, tks lb.	... .01⅞	...	.01⅞	...	.01⅛
Ordinary, bbls lb.	... .01⅝	...	.01⅝	...	.01⅝
Super spruce ext, tks lb.	... .01⅜	...	.01⅜	...	.01⅜
Super spruce ext, bbls lb.	... .01⅞	...	.01⅞	...	.01⅞
Super spruce ext, powd, bgs lb.	... .04	...	.04	...	.04
Starch, Pearl, 140 lb bgs 100 lb.	... 3.10	2.90	3.10	2.50	2.95
Powd, 140 lb bgs 100 lb.	... 3.80	3.05	3.80	2.60	3.05
Potato, 200 lb bgs lb.	.05 ...	.04½	.05½	.05	.07½
Imp, bgs lb.	no prices		no prices	...	.06½
Rice, 200 lb bbls lb.	.07½ .08½	.07½	.08½	.07¼	.08½
Sweet Potato, 240 lb bbls, f.o.b. plant 100 lb.	nom. 7.00	nom.	7.00	5.50	7.00
Wheat, thick, bgs lb.	... .05	...	.05	.05¼	.05½
Strontium, carbonate, 600 lb bbls, wks lb.	no prices		no prices	.22	.23
Nitrate, 600 lb bbls, NY lb.	.07¾ .08¾	.07¾	.08¾	.07¾	.08¾
Sucrose, octa-acetate, den, grd, bbls, wks lb.	... .45	...	.45	...	.45
tech, bbls, wks lb.	... .40	...	.40	...	.40
SULFUR					
Sulfur, crude, f.o.b. mines ton	... 16.00	...	16.00	...	16.00
Flour, com'l, bgs 100 lb.	1.40 1.95	1.40	1.95	1.40	2.35
bbls 100 lb.	1.95 2.50	1.95	2.50	1.95	2.70
Rubbermakers, bgs 100 lb.	... 2.00	...	2.00	2.00	2.80
bbls 100 lb.	... 2.35	...	2.35	2.35	3.15
Extra fine, bgs 100 lb.	... 2.35	...	2.35	2.85	3.00
Superfine, bgs 100 lb.	2.65 2.80	2.65	2.80	2.65	2.80
bbls 100 lb.	2.25 3.10	2.25	3.10	2.25	3.10
Flowers, bgs 100 lb.	2.80 3.35	2.80	3.35	2.80	3.75
bbls 100 lb.	3.15 3.70	3.15	3.70	3.15	4.10
Roll, bgs 100 lb.	2.15 2.70	2.15	2.70	2.15	3.10
bbls 100 lb.	2.30 2.85	2.30	2.85	2.50	3.25
Sulfur Chloride, 700 lb drs, wks lb.	.03 .08	.03	.08	.03	.08
Sulfur Dioxide, 150 lb cyl lb.	.07 .09	.07	.09	.07	.09
Multiple units, wks lb.	.04½ .07	.04½	.07	.04½	.07
tks, wks lb.	.04 .06	.04	.06	.04	.06
Refrigeration, cyl, wks lb.	.16 .40	.16	.40	.16	.40
Mutiple units, wks lb.	.07½ .10	.07½	.10	.07½	.10
Sulfuryl Chloride lb.	.15 .40	.15	.40	.15	.40
Sumac, Italian, grd ton	no prices		no prices	98.00	140.00
Extract, 42°, bbls lb.	.06 .06¼	.06	.06¼	.06	.06¼
Superphosphate, 16% bulk, wks ton	... 8.50	...	8.50	8.50	9.00
Run of pile ton	... 8.00	...	8.00	8.00	8.50
Triple, 40-48%, a.p.a. bulk, wks, Balt. unit ton	... .68	...	.68	.68	.70
Talc, Crude, 100 lb bgs, NY ton	14.00 16.00	14.00	16.00	14.00	15.00
Ref'd 100 lb bgs, NY ton	17.25 19.25	17.25	19.25	14.00	17.25
French, 220 lb bgs, NY ton	no prices		no prices	23.00	35.00
Ref'd, white bgs, NY ton	no prices		no prices	45.00	60.00
Italian, 220 lb bgs to arr ton	no prices		no prices	64.00	70.00
Ref'd, white bgs,, NY ton	no prices		no prices	65.00	78.00
Tankage, Grd, NY unit ‡	... 3.10	2.35	3.10	2.35	3.25
Ungrd unit ‡	... 3.25	2.35	3.35	2.35	3.25
Fert grade, f.o.b. Chgo unit ‡	... 3.60	2.35	3.60	2.40	3.50
South American cif unit ‡	nom. 2.75	2.60	2.75	2.50	3.50
Tapioca Flour, high grade, bgs lb.	.04¼ .06	.03	.06	.02¾	.05
Tar Acid Oil, 15%, drs gal.	.22 .24	.22	.24	.22	.24
25% drs gal.	.25 .27	.25	.27	.25	.28
Tar, pine, delv, drs gal.	.26 .27	.26	.27	.26	.27
tks, delv, E. cities gal.	... .21	...	.21	...	.21
Tartar Emetic, tech, bbls lb.	... .44¾	.36¾	.44¾	.34¼	.36¾
USP, bbls lb.	... .50	.42	.50	.40	.42
Terpineol, den grade, drs lb.	... .17	...	.17	...	.17
Tetrachlorethane, 650 lb drs lb.	.08 .08½	.08	.08½	.08	.08½
Tetrachlorethylene, drs, tech lb.	.08 .09	.08	.09	.08	.09½
Tetralene 50 gal drs, wks lb.	... .19	...	.19	.12	.18
Thiocarbanilid, 170 lb bbls lb.	... .24	...	.24	.20	.25
Tin, crystals, 500 lb. bbls, wks lb.	.39 .39½	.38	.40	.36	.40½
Metal, NY lb.	* ... .52¼	.501	.52⅝	.45½	.55
Oxide, 300 lb bbls, wks lb.	no prices		.54	.56	.51	.56
Tetrachloride, 100 lb drs, wks lb.	.27¾ .28¼	.25¼	.28¼	.23	.26½
Titanium Dioxide, 300 lb bbls lb.	.13½ ...	.13¾	.14	.13	.16
Barium Pigment, bbls lb.	.05¾ .06½	.05¾	.06½	.05¼	.06½
Calcium Pigment, bbls lb.	.05½ .05¾	.05½	.05¾	.05	.06¼

† Bags 15c lower; ‡ + 10; * Apr. 30.

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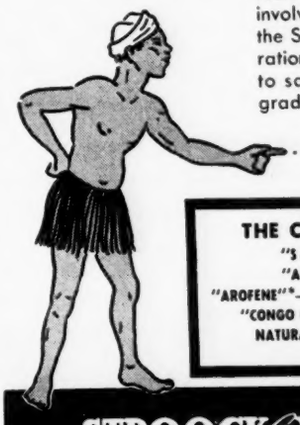

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Titanium Tetrachloride
Zinc Chloride

Prices

	Current Market		1941 Low	1941 High	1940 Low	1940 High
Titanium tetrachloride, drs, f.o.b. Niagara Falls ....lb.	.32	.45	.32	.45	.32	.45
Titanium trichloride 23% sol, bbls f.o.b. Niagara Falls lb.	.22	.26	.22	.26	.22	.26
20% solution, bbls .....lb.	.175	.215	.175	.215	.175	.215
Toluidine, mixed, 900 lb drs, wks .....lb.	...	.26	...	.26	.26	.27
Toluol, 110 gal drs, wks gal.	...	.32	...	.32	.27	.32
8000 gal tks, frt all'd gal.	...	.27	...	.27	.22	.27
Toner Lithol, red, bbls ...lb.	.55	.60	.55	.60	.55	.60
Para, red, bbls .....lb.	.70	.75	.70	.75	.70	.75
Toluidine, bgs .....lb.	...	1.05	...	1.05	1.05	1.35
Triacetin, 50 gal drs, wks, lb.	...	.26	...	.26	...	.26
Triamyl Borate, lcl, drs, wks, lb.	...	.27	...	.27	...	.27
Triamylamine, drs, lcl, wks, drs .....lb.	...	.90	...	.90	.78	.90
Tributylamine, lcl, drs, f.o.b. wks .....lb.	...	.70	...	.70	.67	.70
Tributyl citrate, drs, frt all'd lb.	.24	...	.24	.26	.24	.35
Tributyl Phosphate, frt all'd lb.	...	.42	...	.42	...	.42
Trichlorethylene, 600 lb drs, frt all'd E. Rocky Mts lb.	.08	...	.08	.09	.08	.09
Tricresyl phosphate, tech, drs lb.	.22	.36½	.22	.36½	.22	.36½
Triethanolamine, 50 gal drs, wks .....lb.	...	.19	...	.19	.19	.22
tks, wks .....lb.	...	.18	...	.18	.18	.20
Triethylamine, lcl, drs, f.o.b. wks .....lb.	...	1.05	...	1.05	...	1.05
Triethylene glycol, drs, wks lb.	...	.26	...	.26	...	.26
Trihydroxyethylamine Oleate, bbls .....lb.	...	.30	...	.30	...	.30
Stearate bbls .....lb.	...	.30	...	.30	...	.30
Trimethyl Phosphate, drs, lcl, f.o.b. dest .....lb.	...	.50	...	.50	...	.50
Trimethylamine, c-l, drs, frt all'd E. Mississippi ....lb.	...	.90	.90	1.00	...	1.00
Triphenylguanidine .....lb.	.58	.60	.58	.60	.58	.60
Triphenyl Phosphate, drs ..lb.	...	.38	...	.38	...	.38
Tripoli, airfloated, bgs, wks ton	...	26.00	...	26.00	26.00	30.00
Turpentine (Spirits), c-l, NY dock, bbls .....gal.	...	.50¼	.45	.50¼	.32½	.40
Savannah, bbls .....gal.	...	.38¼*	.33½	.38¼	.26½	.34
Wood Steam dist, drs, c-lcl, NY .....gal.	.42	...	.35	.40	.27	.34½
Wood, dest dist, cl-lcl, drs, delv E. cities .....gal.	...	.36*	.35	.36	.25	.32
Urea, pure 112 lb cases ..lb.	...	.12	...	.12	.12	.15½
Fert grade, bgs, c. i. f. S.A. points .....ton	no prices		no prices		...	110.00
Dom f.o.b., wks .....ton	...	85.00	...	85.00	85.00	101.00
Urea Ammonia, liq., nitrogen basis .....ton	...	121,58	...	121.58	...	121.50
Valonia beard, 42%, tannin bgs .....ton	no prices		no prices		47.00	56.00
Cups, 32% tannin bgs..ton	no prices		no prices		33.00	39.00
Extract, powd, 63% ...lb.	no prices		no prices		.0565	.06
Vanillin, ex eugenol, 25 lb tins, 2000 lb lots .....lb.	...	2.60	...	2.60	...	2.60
Ex-guaiacol .....lb.	...	2.50	...	2.50	...	2.50
Ex-lignin .....lb.	...	2.50	...	2.50	...	2.50
Vermilion, English, kgs ..lb.	3.12	3.17	3.12	3.17	...	2.76
Wattle Bark, bgs .....ton	39.50	41.50	37.50	41.50	34.00	38.75
Extract, 60°, tks, bbls..lb.	.04⅛	.04¼	.03⅞	.04¼	.03⅞	.04¼
Wax, Bayberry, bgs .....lb.	.18	.20	.18	.20	.25	.30
Bees, bleached, white 500 lb slabs, cases .....lb.	.38	.40	.36½	.40	.35	.38
Yellow, African, bgs..lb.	nom.	.30	...	.30	.23	.29
Brazilian, bgs .....lb.	.31	.32	.31	.32	.24	.31
Refined, 500 lb slabs, cases lb.	.35	.36	.35	.36	.29	.36
Candelilla, bgs .....lb.	.22	.22½	.19	.22½	.18	.19
Carnauba, No. 1, yellow, bgs .....lb.	.72	.73	.68	.73	.58	.85
No. 2, yellow, bgs ...lb.	.71	.72	.66	.72	.57	.84
No. 2, N. C., bgs ....lb.	.67	.68	.62	.68	.46	.73
No. 3, Chalky, bgs ...lb.	.61	.62	.55	.62	.43	.66
No. 3, N. C., bgs ....lb.	.63	.64	.58	.63	.47	.68
Ceresin, dom, bgs .....lb.	.11	.11½	.11	.11½	.11½	.15
Japan, 224 lb cases ....lb.	.18	.18½	.16½	.18½	.15½	.16½
Montan, crude, bgs ....lb.	no prices		no prices		no prices	
Paraffin, see Paraffin Wax.						
Spermaceti, blocks, cases lb.	.24	.25	.24	.25	.22	.25
Cakes, cases .....lb.	.25	.26	.25	.26	.23	.25
Wood Flour, c-l, bgs ....ton						
bgs, c-l, wks .....ton	24.00	25.00	24.00	25.00	20.00	30.00
Whiting, chalk, com 200 lb	18.00	19.00	18.00	19.00	11.50	19.00
Gilders, bgs, c-l, wks ..ton	16.00	20.00	16.00	20.00	12.00	20.00
Xylol, frt all'd, East 10* tks, wks .....gal.	...	.29	...	.29	...	.30
Com'l tks, wks, frt all'd gal.	...	.26	...	.26	...	.27
Xylidine, mixed crude, drs lb.	.35	.36	.35	.36	.35	.36
Zein, bgs, 1000 lb lots, wks .....lb.	...	.20	...	.20	...	.20
Zinc Acetate, tech, bbls, lcl, delv .....lb.	.15	.16	.15	.16	.15	.16
Arsenite, bgs, frt all'd..lb.	...	.12	...	.12	.12	.12½
Carbonate tech, bbls, NY lb.	.14	.16	.14	.16	.14	.16
Chloride fused, 600 lb drs, wks .....lb.	...	.04¼	...	.04¼	.04¼	.046
Gran, 500 lb drs, wks lb.	...	.05	...	.05	.05	.05¾
Soln 50%, tks, wks 100 lb.	...	2.25	...	2.25	...	2.25

* May 29.

		Current Market		1941 Low	1941 High	1940 Low	1940 High
Zinc (continued):							
Cyanide, 100 lb drs	lb.	.33	.35	.33	.35	...	.33
Dust, 500 lb bbls, c-l, delv	lb.	...	.09¼	...	.09¼	.07½	.08½
Metal, high grade slabs, c-l, NY	1000 lb.	...	7.65	...	7.65	5.90	7.64
E. St. Louis	100 lb.	...	7.25	...	7.25	4.60	7.25
Oxide, Amer, bgs, wks	lb.	...	.06½	...	.06½	.06¼	.07½
French 300 lb bbls, wks	lb.	...	.06¾	...	.06¾	.06¼	.07¾
Palmitate, bbls	lb.	.24½	.27½	.24½	.27½	.23	.27½
Resinate, fused, pale bbls	lb.	...	.10	...	.10	...	.10
Stearate, 50 lb bbls	lb.	...	.22	...	.22	.21½	.24½
Sulfate, crys, 40 lb. bbls wks	lb.	...	.315	...	.315	.0275	.029
Flake, bbls	lb.	...	.335	...	.335	...	.0325
Sulfide, 500 lb bbls, delv	lb.	...	.08	...	.08	.07¾	.08
bgs, delv	lb.	...	.07¾	...	.07¾	.07½	.07¾
Sulfocarbolate, 100 lb kgs	lb.	.24	.29	.24	.29	.24	.26
Zirconium Oxide, crude, 70-75% grd, bbls, wks	ton	75.00	100.00	75.00	100.00	75.00	100.00

Oils and Fats

Babassu, tks, futures	lb.	no prices		...	.06	.05¾	.06⅝
Castor, No. 3, 400 lb drs	lb.	.11	...	.09¾	.11	.09¾	.12¾
Blown, 400 lb drs	lb.	.12¾	...	.11¾	.12¾	.11¾	.14¾
China Wood, drs, spot NY	lb.	.31	.31¼	.27¼	.31¼	.22½	.28
Tks, spot NY	lb.	...	.28½	.26¼	.28½	.21½	.27
Coconut, edible, drs NY	lb.	...	.11	.08	.11	.07½	.09⅜
Manila, tks, NY	lb.	.07	nom.	.03⅜	.07	.02¾	.03⅜
Tks, Pacific Coast	lb.	...	no prices			.03¼	.02¾ .03¼
Cod, Newfoundland, 50 gal bbls	gal.	.74	nom.	.60	.75	.60	.72
Copra, bgs, NY	lb.		.0385	.0180	.0385	.0165	.0190
Corn, crude, tks, mills	lb	.09⅜	nom.	.06⅝	.09⅜	.05⅛	.06½
Refd, 375 lb bbls, NY	lb	.11½	nom.	...	.11½	.07⅞	.09
Degras, American, 50 gal bbls, NY	lb	.08	.08¼	.07¼	.08¼	.08	.10
Greases, Yellow	lb		.07¼	.04¾	.07¼	.03	.05¼
White, choice, bbls, NY	lb	nom.	.07¾	.05	.07¾	.03¼	.05⅝
Lard, Oil, Edible, prime	lb	...	.10¾	.08¼	.10¾	.08	.10
Extra, bbls	lb	...	.11¼	.08¼	.11¼	.06¾	.09¾
Extra, No. 1, bbls	lb	...	.11	.08	.11	.06⅞	.08⅞
Linseed, Raw less than 5 drs lots	lb.		.115	.091	.115	.09	.116
drs, c-l, spot	lb.	.170	.190	.095	.190	.084	.110
Tks	lb	.10	.102	.084	.102	.078	.104
Menhaden, tks, Baltimore	gal	.52½	nom.	.30	.52½	.21	.35
Refined, alkali, drs	lb		.108	.084	.108	.067	.088
Kettle boiled, drs	lb		.118	.096	.118	.079	.10
Light pressed, drs	lb		.098	.082	.098	.061	.085
Tks	lb		.088	.072	.088	.055	.072
Neatsfoot, CT, 20°, bbls, NY	lb		.18¼		.18¼	.15¼	.19¼
Extra, bbls, NY	lb.		.11¼	.08¼	.11¼	.06⅞	.09
Pure, bbls, NY	lb		.12¼		.12¼	.08	.14¼
Oiticica, bbls	lb	.20	.20½	.16½	.20½	.17	.21
Oleo, No. 1, bbls, NY	lb		.11¼	.07¾	.11¼	.07¾	.07¾
No. 2, bbls, NY	lb		.11¼	.07⅜	.11¼	.07⅜	.07⅜
Olive, denat, bbls, NY	gal	nom.	3.50	2.25	3.50	.94	2.40
Edible, bbls, NY	gal	4.44	4.50		4.50	1.85	3.25
Foots, bbls, NY	lb	.16	nom.	.10¼	.16	.08	.10¼
Palm, Kernel, bulk	lb	no prices		no prices		no prices	
Niger, cks	lb	nom.	.05¾	.04¼	.05¾	.03¼	.05½
Sumatra, tks	lb	nom.	.05½	.02	.05½	.02¼	.03
Peanut, crude, bbls, NY	lb	nom.	.10	.08¾	.10	.06¾	.09
Tks, f.o.b. mill	lb	no prices		.05¼	.07⅛	.05⅛	.07⅛
Refined, bbls, NY	lb	nom.	.13¼	.08	.13¼	.07⅜	.09¾
Perilla, drs, NY	lb	.18½	.19	.18	.19	.19	.21
Tks, Coast	lb.	...	.17½	.16½	.17½	.18½	.20
Pine, see Pine Oil, Chem. Se							
Rapeseed, blown, bbls, NY	lb.	.16½	.16¾		.17½	.17	.17½
Denatured, drs, NY	gal.	no prices		.95	1.00	1.00	1.05
Red, Distilled, bbls	lb	.11	.12	.07¼	.12	.06¼	.09½
Tks	lb.	.10¼		.06¼	.11½	.05¾	.08
Sardine, Pac Coast, tks	gal	nom.	.55	.39	.55	.31	.39
Refined alkali, drs	lb	...	.108	.084	.108	.067	.088
Light pressed, drs	lb.	..	.098	.078	.098	.061	.082
Tks	lb.	...	.088	.072	.088	.055	.072
Sesame, white, dom	lb.	nom.	.09½	...	.09½	.07¼	.11¾
Soy Bean, crude							
Dom, tks, f.o.b. mills	lb	.10¾	.11	.05½	.11	.04¾	.06¼
Crude, drs, NY	lb	.10¾	.11	.06¼	.11	.05¾	.07¾
Ref'd, drs, NY	lb.	.11	.10¾	.07⅝	.11	.07¼	.08½
Tks	lb.	.10¾	.11	.05⅜	.11	.06¼	.07⅝
Sperm, 38° CT, bleached bbls, NY	lb.	...	.117	.11	.117	.105	.11
45° CT, blchd, bbls, NY	lb.	.	.11	.103	.11	.098	.103
Stearic Acid, double pressed dist bgs	lb.	.12¾	.13¾	.09½	.13¾	.09¾	.13
Double pressed saponified bgs	lb.	.13	.14	.09¾	.14	.10	.13¾
Triple pressed dist bgs	lb.	.15½	.16½	.12½	.16½	.12½	.16½
Stearine, Oleo, bbls	lb	nom.	.09	...	.09	.05¼	.06½
Tallow City, extra loose	lb.	.07¾	...	...	.07¾	.03⅜	.05⅜
Edible, tierces	lb.	no prices			.05⅛	.04⅜	.05¼
Acidless, tks, NY	lb.	...	.08¾	.07½	.08¾	.06¼	.08
Turkey Red, single, drs	lb.	...	.06½	.06½	.07	.082	.09
Double, bbls	lb.	...	.09½	.09½	.11	.11	.12¾
Whale:							
Winter bleach, bbls, NY	lb	...	.099	...	.099	...	.095
Refined, nat, bbls, NY	lb	...	.095	...	.095	...	.091

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The Reader Writes

(*Continued from page 692*)

sheets. On the other hand, it might become necessary to do something from a display point of view on subjects that have to be "glamourized" to get people interested enough to read copy.

Of course, if you could presume that everyone that asked for or received a piece of printed material was actually interested in it, there would never be any worry about form. You could print your literature on newsprint in solid type and the violently interested student would dig out the facts. Unfortunately you cannot make this assumption.

We do believe, however, that there is everything to be said in favor of standardization as to size, and throughout the literature of all of our associated companies, we endeavor to hold rather rigidly to three sizes. These are 8½ x 11 size for pieces that will ultimately be kept in file drawers; 6 x 9 for reference books that are made to be kept in bookcases; and envelope size for those pieces that are transient in interest only, where the information is to be handled in the mail. Even where reprints are made from articles printed in magazines of non-standard size we normally make up the material in one of these standard sizes.

Probably the most significant factor, it seems to us, in getting your literature saved is to have information in the literature that is worth saving. Of course, if in addition the form can be convenient and useful you are just that much further ahead.

A Well-Known Advertising Manager

I read with interest the letter and the editorial covering possible standardization of sales promotion material, which appeared in the April issue of CHEMICAL INDUSTRIES. As a matter of fact the issue was circulated by me to the gentlemen in those departments from which many of our booklets, etc., originate and their attention was called to this matter and a number of discussions have resulted.

In theory, Mr. Baumeister's comments are quite correct but in practice the facts are that there is competition between the reading material received by those to which it is directed in the same way that there is competition in the printed advertisement pages which appear in your journals and all other journals. Competition in readability, reader acceptance, eye appeal, etc., etc. It seems to me that it is mostly this competitive phase which influences publishers to issue reading material in various formats.

As a matter of fact we are not so very anxious to have those who receive our literature file it away—we want them to keep it handy and read it and use it at their desks or in their plant. As you must know from your own experience the filing cabinet is usually or at least often the graveyard of many a good piece of sales literature.

I personally believe that there are good arguments on both sides of the question. We, ourselves, issue a number of bulletins and booklets, etc., of a standard 8½ x 11 size and I am quite sure that the letter and editorial referred to by you will have a tendency to point us still further in that direction, at least for the time being and as a matter of experiment in some cases. The subject is constantly under review and should there be anything of interest along these lines to report I shall be glad to get in touch with you.

From a Sales Manager

The comparison you make of your own pamphlet situation, of course, is not analogous because this size is mainly predicated on the size of your own publication. From my own viewpoint I lean towards the 5 x 8″ size as this certainly seems to be one that is more in general use for the chemical industry and considering the widespread use for which these publications are intended, I am sure that many of them wind up in the individual's desk drawer and these 5 x 8″ certainly do stow away without much effort.

I think it would be well for you to get out a Questionnaire to a lot of the chemical companies to find out, say, within the last 3 years, how many trade publications have been issued, size, number of pages, etc., so that you can get a cross-section of opinion.

This would certainly seem worthy of any effort you make in this direction because, in the last analysis, they should be put out in a form that is most suitable for the buyer.

Briefs From the Editor's Mail

Dr. Alfred Seely Brown of Colgate University suggests—"Include brief manufacturing data in the Guidebook Number."

John E. McKeen, assistant plant superintendent, Chas. Pfizer & Co., writes "Continue to expand the recent progressive advances and provide as much "news" about the industry as possible."

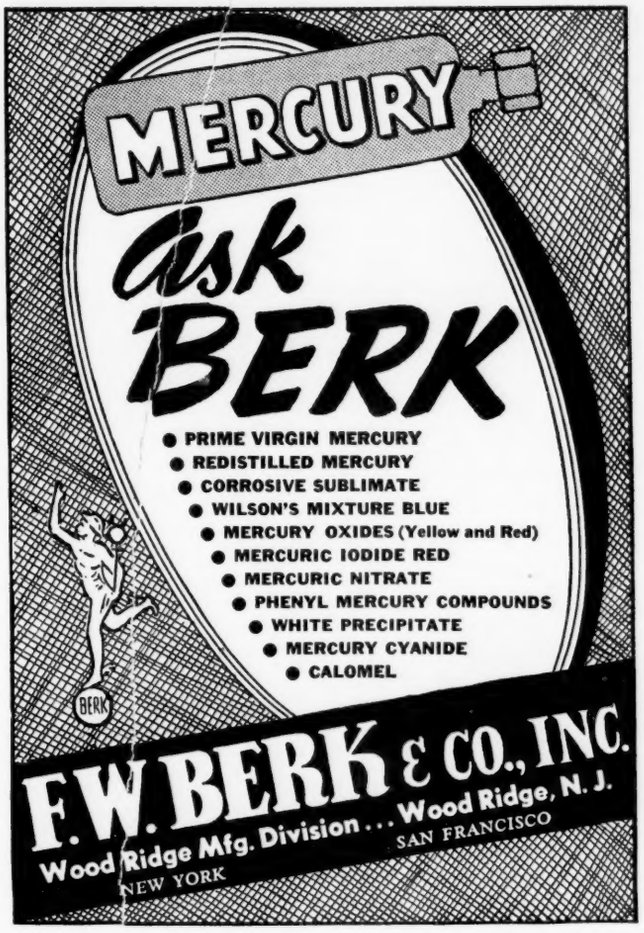
Drug, Chemical Meeting

Sixth Annual Fall Meeting and Golf Tournament of the Drug, Chemical & Allied Trades Section of the N. Y. Board of Trade will be held at Skytop Club, Skytop, Pa., Oct. 23 to 26. Program committee consists of Victor E. Williams, chairman, J. P. Remensnyder, S. B. Penick, Jr. and John C. Ostrom.

Herty Medalist

Dr. William F. Hand, professor of chemistry at Mississippi State College for over 40 years, was the recipient of the Herty medal presented May 3 at the Georgia State College for Women, Milledgeville, Ga. Annual award, presented in honor of the late Dr. Charles H. Herty, pioneer chemist who made newsprint from Southern pine, was given in recognition of Dr. Hand's work in oil chemistry and as a designer and builder of apparatus.

New, revised list of standard specifications for seamless tubes and pipe is available from Babcock & Wilcox Tube Co., Beaver Falls, Pa. Ask for technical data card 107A.



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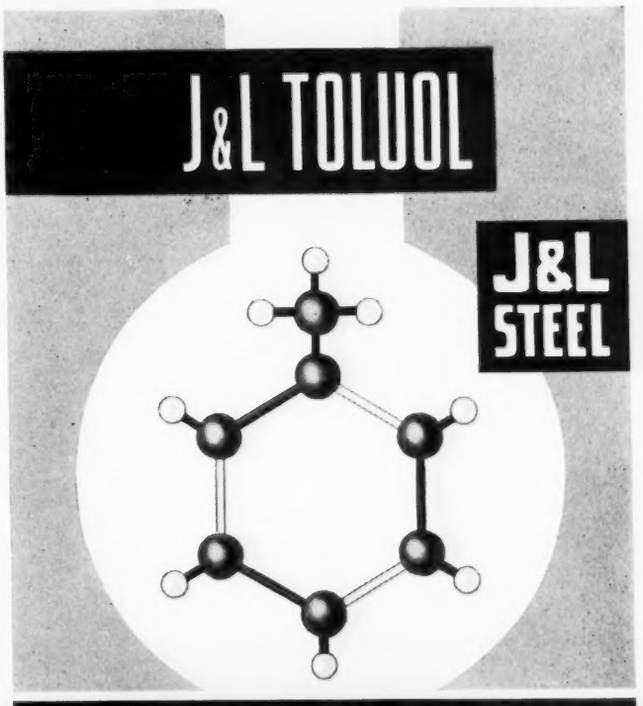

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"We"—Editorially Speaking

"The 6,000 tons of magnesium produced in this country last year were made by an electrolytic process controlled by the German metals cartel." This from the *Saturday Evening Post* ("Builder No. 1," by Frank J. Taylor, June 7, page 124). We suggest Mr. Taylor, the editors of the *Saturday Evening Post* and the *Post* admirers take the trouble to read "Magnesium in the National Defense" in this issue and an editorial "What Are the True Facts About Magnesium" which appeared in our February issue, page 218.

❖❖❖❖

In the Census of Progeny in the current issue of the Chemists' Club Percolator there is the statement "The number of children per member reporting is about 22." A lot of members certainly took their hair down, or perhaps there is something to this vitamin slant, or perhaps Howard Farkas was counted in. However, "Dave" Killeffer reports that the members are not quite that prolific and the printer just skipped a decimal point.

❖❖❖❖

John Weiss reports overhearing a salesman and a "P A" in a hot argument at the recent Chemists' Club golf tournament. The salesman it appeared was trimming the "P A" unmercifully and the latter was complaining that in former years the salesman always played a good game of "customer's" golf.

"Hells bells," retorted the salesman, "I'm out here to get cancellations not orders."

❖❖❖❖

After listening to the phoney former Russian Surgeon-General at the banquet of the Chemical Engineers at Chicago followed up by the equally phoney Senor Francisco Juarez at the M. C. A.-S. O.-C. M. A. dinner at Skytop we are going to insist on a television set for the next "Fireside Chat."

❖❖❖❖

An observing friend of ours that was at both of these meetings remarked just the other day that the chemical engineers' faces showed a great deal more strain. That's probably true—they are the fellows that must produce the miracles but a lot of salesmen and executives are finding it pretty difficult too, saying "no" to many of their good friends.

❖❖❖❖

Writing this month's markets ought to be easy—everything is tight.

Fifteen Years Ago

From Our Files of June, 1926

S. O. C. M. A. holds annual outing at Briarcliff Manor, N. Y. The M. C. A. holds annual meeting at the Whitehall Club, N. Y. City, with Elon H. Hooker presiding.

Finding of potash in 15 additional wells in Texas and New Mexico is reported by the Department of Interior.

Commercial Solvents is erecting a plant at Peoria to make synthetic ammonia.

Du Pont Rayon Co. is producing about 800,000 pounds of rayon monthly at Old Hickory, Tenn.

American Trona Corp. has been acquired by merger by American Potash and Chemical Corp.

With the choice array of articles arranged for our July and August issues we can assure our readers that there will be no "summer dullness." How're the following examples? "Metals and Alloys in the National Defense," by Dr. Bruce Gonser of the Battelle Memorial Institute; "Plastics in the Present Emergency," by Dr. T. S. Carswell, Director of Monsanto's Plastics Division. "Industrial Stream Pollution Problems and Their Solution," by Richard D. Hoak, Mellon Institute; "Petroleum Products in Industrial and Process Oils," by Drs. J. C. Zimmer and E. W. Carlson.

And a little later—"The Situation in Rubber," by Dr. William C. Geer; "Salt as a Chemical Raw Material," by Dr. C. D. Looker, Director of Research of International Salt.

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After that little spell of unpleasantness, The Madison, Wisconsin, oil suits—the oil industry must have been overjoyed(?) at the news that Harold Ickes is to be the oil czar.

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Leon Henderson is out to see that companies don't make any money and Morgenthau to take away all the big juicy profits. It is going to be interesting to see which makes good.

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One wit reports that gasless Sundays will be excellent excuses for not visiting the mother-in-law. She might decide however, to help Uncle Sam conserve oil by moving in next winter.

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Looking through our back issues for material for "Fifteen Years Ago" we ran across the following—"No-Worry Chemical Co., of Newark, N. J., will erect an addition to cost $20,000."—Oh! for the good old days!

CALENDAR OF EVENTS

June

June 16-20, The American Society of Mechanical Engineers, Semi-Annual Meeting, Kansas City, Mo.

June 17-19, National Farm Chemurgic Council, First Annual Southern Conference, Hermitage Hotel, Nashville, Tennessee.

June 19-20, Pennsylvania Grade Crude Oil Assn., Annual Meeting, Bradford, Pa.

June 19-21, New York State Sewage Works Assoc., Spring Meeting, Niagara Falls, N. Y.

June 20, Akron Rubber Group, Summer outing, Silver Lake Country Club.

June 20, American Association of Textile Chemists and Colorists, New York Section, No. Jersey Country Club, Paterson, N. J.

June 20, American Association of Textile Chemists and Colorists, Philadelphia Section, Whitemarsh Valley Country Club.

June 20, American Association of Textile Chemists and Colorists, Rhode Island Section, Norwich Inn, Norwich, Conn.

June 22-26, American Water Works Association, Royal York Hotel, Toronto, Canada.

June 23-25, The American Leather Chemists Association Annual Meeting, The Sagamore, Balton Landing on Lake George, New York.

June 23-27, American Society of Testing Materials, Annual Meeting, Palmer House, Chicago, Ill.

Wk. June 22, American Pharmaceutical Manufacturers' Association Annual Meeting, New Ocean House, Swampscott, Mass.

June 23-27, American Society for Testing Materials, Annual Meeting and Exhibit of Testing Apparatus and Related Equipment, Chicago, Ill.

June 27, Louisville Paint, Varnish and Lacquer Assoc., Annual Golf Outing, Audubon Country Club, Louisville, Ky.

July

July 8, Chemical Salesmen Association, Golf Tournament, Plandome Golf Club, Plandome, L. I.

July 23-25, American Society of Civil Engineers, Annual Convention, San Diego, Calif.

August

Aug. 7-9, American Water Works Assoc. Meeting, Western Pennsylvania Section, Erie, Pa.

Aug. 12, Chemical Salesman Association, Golf Tournament, Montclair Golf Club, Montclair, N. J.

September

Sept. 3, American Institute of Consulting Engineers, Luncheon Meeting, City Midday Club, New York City.

Sept. 10, Gypsum Association, Fall Meeting, Commodore Hotel, New York City.

Sept. 8-12, American Chemical Society, Semi-Annual Meeting, Atlantic City, N. J.

Sept. 10-12, National Assn. Printing Ink Makers, Annual Convention, Greenbrier, White Sulphur Springs, W. Va.

Sept. 18, Louisville Paint & Varnish Production Club, Brown Hotel, Louisville, Ky.

Sept. 18, New England Paint & Varnish Production Club, Regular Monthly Meeting, Hotel Vendome, Boston, Mass.

Sept. 18-19, American Water Works Assoc., Meeting of Rocky Mountain Section, Santa Fe, New Mexico.

Sept. 18-20, National Association of Photo Lithographers, Annual Exhibit and Convention, Netherland Plaza Hotel, Cincinnati, Ohio.

Sept. 22-25, Illuminating Engineering Society, Atlanta Biltmore Hotel, Atlanta, Ga.

Sept. 24-26, American Water Works Assoc., Meeting of Michigan Section, Grand Rapids, Mich.

Sept. 29, National Wholesale Druggists' Ass'n, Annual Convention, Greenbrier Hotel, White Sulphur Springs, W. Va.

TECHNOLOGY DEPT.

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State of Chemical Trade
Current Statistics (May 31, 1941)—p. 82

WEEKLY STATISTICS OF BUSINESS

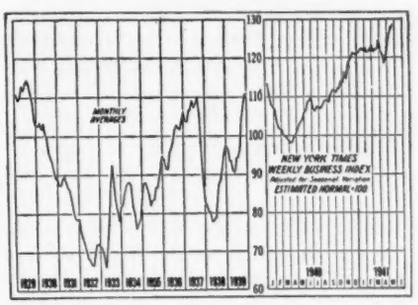
Week Ending	Carloadings 1941	Carloadings 1940	Carloadings % of Change	Electrical Output† 1941	Electrical Output† 1940	Electrical Output† % of Change	Jour. of Com. Price Index	*Nat'l Chem. & Drugs	Fertilizer Fats & Oils	Ass'n Fert. Mat.	Price Indices Mixed Fert.	Price Indices All Groups	†Labor Dept. Chem. & Drug Price Index	% Steel Activity	N. Y. Times Index Bus. Act.	Fisher Commodity Index
May 3.....	794,301	665,547	+19.3	2,914,882	2,503,899	+16.4	86.9	104.3	99.1	107.0	101.2	104.5	82.8	94.3	123.7	89.9
May 10.....	837,149	680,628	+23.0	2,975,024	2,515,515	+18.3	88.2	104.3	108.9	107.0	101.2	105.8	83.1	96.8	126.2	90.7
May 17.....	861,277	679,065	+26.8	2,982,715	2,550,071	+17.0	88.7	104.3	111.1	107.1	101.1	106.7	83.7	99.2	127.8	91.7
May 24.....	866,017	687,480	+26.0	3,011,754	2,588,821	+16.3	88.6	104.8	111.5	107.1	101.1	106.8	84.2	99.9	128.4	92.4
May 31.....	801,783	639,120	+25.5	2,898,000	2,477,689	+17.0	88.6	104.8	110.8	107.1	101.1	106.9	83.9	98.6	128.0	92.4

† K.W.H. 000 omitted. * Base period changed Jan. 4 from 1926-1928 average to 1935-1939 average as 100.

MONTHLY STATISTICS

CHEMICAL:	Apr. 1941	Apr. 1940	Mar. 1941	Mar. 1940	Feb. 1941	Feb. 1940
Acid, sulfuric (expressed as 50° Baumé, short tons, Bureau of the Census)						
Total prod. by fert. mfrs.	.....	.....	234,026	196,290	226,069	212,719
Consumpt. in mfr. fert.	.....	.....	177,376	149,303	162,306	158,592
Stocks end of month	.....	.....	98,151	93,231	100,338	93,132
Alcohol, Industrial (Bureau Internal Revenue)						
Ethyl alcohol prod., proof gal.	26,248,451	20,217,862	21,702,074	20,983,159	22,030,203	20,381,276
Comp. denat. prod., wine gal.	294,890	267,688	513,986	413,509	462,031	453,848
Removed, wine gal.	325,044	229,930	519,084	399,479	450,931	412,602
Stocks end of mo., wine gal.	440,092	378,240	470,282	340,800	475,811	327,290
Spec. denat. prod., wine gal.	12,358,711	9,726,136	12,678,139	9,110,799	10,093,722	8,005,830
Removed, wine gal.	12,125,576	9,561,557	12,819,899	9,094,254	10,107,165	8,092,287
Stocks end of mo., wine gal.	1,070,625	1,212,441	842,969	1,051,623	989,130	1,038,274
Ammonia sulfate prod., tons *a*	.....	.....	645,235	56,054	58,359.5	53,474.5
Benzol prod., gal. *b*	.....	.....	13,505,000	9,952,000	11,765,000	11,536,000
Byproduct coke, prod., tons *a*	.....	.....	4,999,309	4,124,748	4,502,091	4,016,742
Cellulose Plastic Products (Bureau of the Census)						
Nitrocellulose sheets, prod., lbs.	927,399	532,327	844,819	789,307	720,173	723,107
Sheets, ship., lbs.	819,485	561,119	794,199	607,267	755,513	594,261
Rods, prod., lbs.	356,179	245,078	363,429	231,297	314,560	246,298
Rods, ship., lbs.	342,448	231,937	342,024	255,511	299,793	257,399
Tubes, prod., lbs.	136,048	74,849	99,345	69,036	97,399	46,797
Tubes, ship., lbs.	104,665	55,106	96,298	61,739	89,831	66,739
Cellulose acetate, sheets, rod, tubes						
Production, lbs.	402,492	558,358	464,601	550,138	441,482	636,834
Shipments, lbs.	408,252	490,206	372,804	588,516	502,025	655,076
Molding comp., ship.; lbs.	2,102,084	903,785	1,990,982	1,021,579	1,641,978	877,685
Methanol (Bureau of the Census)						
Production, crude, gals.	454,817	506,937	454,817	506,937	435,079	446,815
Production, synthetic, gals.	3,672,830	3,462,946	3,672,830	3,462,946	3,170,636	3,782,402
Pyrozylin-Coated Textiles (Bureau of the Census)						
Light goods, ship., linear yds.	4,158,396	2,859,620	3,806,132	2,793,435	3,466,902	2,744,749
Heavy goods, ship., linear yds.	3,158,924	2,143,781	3,294,035	2,184,457	3,032,393	2,116,841
Pyroxylin spreads, lbs. *c*	6,930,713	4,772,332	6,691,648	4,769,189	6,262,184	4,930,415
Exports (Bureau of Foreign & Dom. Commerce)						
Chemicals and related prod. *d*	.....	.....	$20,863	$18,780	$18,554	$16,670
Crude sulfur *d*	.....	.....	$222	$419	$739	$849
Coal-tar chemicals *d*	.....	.....	$2,706	$2,539	$2,269	$2,421
Industrial chemicals *d*	.....	.....	$5,082	$4,467	$4,741	$4,727
Imports						
Chemicals and related prod. *d*	.....	.....	$5,537	$6,681	$4,067	$5,422
Coal-tar chemicals *d*	.....	.....	$593	$1,113	$624	$419
Industrial chemicals *d*	.....	.....	$996	$1,108	$806	$1,136
Employment (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	.....	.....	.....	.....	127.9	121.0
Other than petroleum	.....	.....	.....	.....	130.1	121.1
Chemicals	.....	.....	.....	.....	155.0	136.1
Explosives	.....	.....	.....	.....	159.9	105.5
Payrolls (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	.....	.....	.....	.....	144.4	131.4
Other than petroleum	.....	.....	.....	.....	148.3	130.4
Chemicals	.....	.....	.....	.....	194.0	159.7
Explosives	.....	.....	.....	.....	205.3	127.5
Price index chemicals*	86.4	85.0	85.9	85.1	78.5	77.5
Drugs & Pharmaceuticals*	97.5	81.8	97.2	81.4	96.9	81.3
Fert. mat.*	71.0	70.7	70.4	70.6	70.4	71.0
Paint and paint mat.	88.7	86.7	87.4	87.2	86.6	86.8
FERTILIZER:						
Exports (long tons, Nat. Fert. Association)						
Fertilizer and fert. materials	.....	.....	90,255	60,332	94,316	53,398
Total phosphate rock	.....	.....	58,678	31,691	70,812	16,708
Total potash fertilizers	.....	.....	3,351	637	6,450	475
Imports (long tons, Nat. Fert. Association)						
Fertilizer and fert. materials	.....	.....	154,574	181,636	97,677	147,975
Sodium nitrate	.....	.....	84,337	86,039	40,254	26,506
Total potash fertilizer	.....	.....	14,110	40,094	1,436	65,486

INDUSTRIAL TRENDS



Business: After slight declines in April due to the bituminous coal strikes industrial production indexes have resumed their climbs to new high ground. *The New York Times* index of business activity established a record of 128.4 in the week ended May 24. Carloadings, electrical output, manufacturers and retail sales are still high. Commodity prices are climbing.

Steel: The steel industry made a quick recovery after the curtailment caused by shortages of coal. Operations for the week beginning June 2 were scheduled at 99.2% of ingot capacity. Orders continue in excess of production and shipments, thereby further expanding backlogs. The OPM has decided that it will be better and quicker to increase the production by expanding present facilities rather than by adding new facilities. In this direction a committee has been appointed to work out details for an increase in capacity of ten million tons.

Automotive: Automotive production and sales are holding at peak levels. During the week ended June 7 production was estimated at 133,645 units the highest point reached so far this year. The total for the same 1940 period was 95,560. Because of the unprecedented demand for new cars the industry will strive to maintain the high rate as long as manpower and materials are available. These factors depend almost entirely on the tieup that will probably come between the industry and the national defense setup.

Retail sales in May exceeded 600,000 as compared with 385,591 a year ago. It is expected that during June sales will go to 700,000 and will probably wipe out the stocks that producers have been trying to accumulate.

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Carloadings: After a decline in April due to the coal strikes, loadings of freight have again spurted ahead. During the week ended May 24, 866,017 cars were loaded. This is the highest total for any week since Nov. 9, 1930. For the month of May as a whole loadings have averaged about 25% better than the same period last year.

Electric Output: For the year ending May 30, 1941, the Edison Electric Institute reports that new all-time high records were scored in generation, sales and revenues from electrical operations. In spite of the greatly increased production, profits gained only about 2% over 1940.

Construction: According to the F. W. Dodge Corporation, value of Construction awards during April declined somewhat from the high March total. The main factor in the decrease was the smaller volume of defense plant contracts. Contracts for publicly financed defense housing increased somewhat, and activity in private residential buildings rose by about the usual seasonal amount.

Textiles: Demand for textile products continue at high levels. Production schedules continue to be revised upward. Cotton mills are operating 24 hours a day, 6 days a week, and have been asked to operate on Sundays, too. Consumption of raw cotton in April amounted to 920,000 bales, a new record level.

Output of rayon in the first quarter of 1941 set a new record of 106,200,000 lbs. as compared with 103,700,000 lbs. in 1940.

Commodity Prices: Prices of basic commodities continue to advance sharply. Increases were most pronounced for agricultural products. Semi-manufactured industrial items including petroleum products, coke, leather, textile yarns and fabrics, and building materials advanced. Metal prices for the most part are now under Government Control and maximum levels have been established.

Retail Trade: Sales during May were about 15% better than the comparable period of last year. Activity is most pronounced in the industrial section of the midwest.

Outlook: Production and industrial activity, which in the past few months has been held back by strikes, has regained momentum and will probably hold its pace. The Government, by its action in the strike at the North American Aviation Co., in Inglewood, Calif., seems, at last, to have accepted responsibility in labor disputes. It seems that the method used there will set a precedent, and if so, will undoubtedly prevent any serious loss of production from strikes.

MONTHLY STATISTICS (cont'd)

	Apr. 1941	Apr. 1940	Mar. 1941	Mar. 1940	Feb. 1941	Feb. 1940
FERTILIZER: (Cont'd)						
Superphosphate e (Nat. Fert. Association)						
Production, total	.....	.....	363,233	296,798	334,697	318,788
Shipments, total	.....	.....	662,592	594,321	350,343	269,588
Northern area	.....	.....	239,439	165,041	129,961	88,574
Southern area	.....	.....	423,153	429,280	220,382	181,014
Stocks, end of month, total	.....	.....	1,707,794	1,734,663	1,967,724	2,006,283
Tag Sales (short tons, Nat. Fert. Association)						
Total, 17 states	1,461,189	1,183,033	1,487,101	1,639,828	858,255	717,752
Total, 12 southern	1,390,782	1,125,397	1,367,307	1,538,065	765,196	676,256
Total, 5 midwest	70,407	57,636	119,794	101,763	93,059	41,496
Fertilizer employment *i*	.....	.....	.....	.....	110.2	109.3
Fertilizer payrolls *i*	.....	.....	.....	.....	90.6	83.7
Value imports, fert. and mat. *d*	.....	.....	$2,901	$3,737	$2,109	.....
GENERAL:						
Acceptances outst'd'g *f*	$219	$223	$217	$229	$211	$233
Coal prod., anthracite, tons	.....	.....	.....	3,773,000	4,430,000	4,977,000
Coal prod., bituminous, tons	.....	.....	.....	35,400,000	41,450,000	44,070,000
Com. paper outst'd'g *f*	$274	$238	$263	$233	$240	$226
Failures, Dun & Bradstreet	1,149	1,291	1,211	1,197	1,129	.....
Factory payrolls *i*	.....	.....	.....	98.2	126.4	99.3
Factory employment *i*	.....	.....	.....	100.8	117.7	105.0
Merchandise imports *d*	.....	.....	$267,784	$216,755	$233,702	$200,068
Merchandise exports *d*	.....	.....	$357,565	$350,784	$303,413	$347,106
GENERAL MANUFACTURING:						
Automotive production	462,257	432,746	507,868	423,620	485,523	404,032
Boot and Shoe prod., pairs	42,772,202	31,816,239	42,662,834	34,550,750	38,005,922	36,442,348
Bldg. contracts, Dodge *j*	$406,675	$300,504	$479,903	$272,178	$270,373	$200,574
Newsprint prod., U. S. tons	.....	.....	87,376	85,143	79,720	81,455
Newsprint prod., Canada, tons.	.....	.....	275,769	251,279	245,607	231,823
Glass containers, gross‡	.....	.....	5,128	4,606	4,368	4,123
Plate glass prod., sq. ft.	.....	.....	18,266,400	14,302,100	15,664,200	13,175,200
Window glass prod., boxes	.....	.....	1,416,869	1,107,400	1,397,100	1,099,100
Steel ingot prod., tons	.....	.....	42,662,834	34,550,750	6,250,413	4,527,141
% steel capacity	.....	.....	$479,903	$272,178	96.8	70
Pig iron prod., tons	.....	.....	4,704,135	3,270,499	4,197,872	3,311,480
U.S. cons'pt. crude rub., lg. tons	.....	.....	.....	.....	61,016	49,832
Tire shipments	.....	.....	.....	.....	4,910,365	4,112,379
Tire production	.....	.....	.....	.....	5,165,404	4,888,250
Tire inventories	.....	.....	.....	.....	10,071,857	10,123,824
Cotton consumpt., bales	920,142	623,098	854,179	.....	793,626	661,771
Cotton spindles oper.	22,787,396	22,288,832	22,795,742	22,553,360	22,769,368	22,800,726
Silk deliveries, bales	.....	.....	23,800	19,596	26,049	22,485
Wool consumption *s*	.....	.....	.....	.....	47.0	31.4
Rayon deliv., lbs.	.....	.....	35,200,000	29,800,000	31,600,000	29,800,000
Rayon employment *i*	.....	.....	.....	.....	317.5	313.3
Rayon payrolls *i*	.....	.....	.....	.....	337.0	321.3
Soap employment *i*	.....	.....	.....	.....	90.3	84.4
Soap payrolls *i*	.....	.....	.....	.....	114.0	100.3
Paper and pulp employment *i*	.....	.....	.....	.....	117.2	113.0
Paper and pulp payrolls *i*	.....	.....	.....	.....	132.0	116.9
Leather employment *i*	.....	.....	.....	.....	87.8	86.6
Leather payrolls *i*	.....	.....	.....	.....	92.1	83.3
Glass employment *i*	.....	.....	.....	.....	115.0	102.5
Glass payrolls *i*	.....	.....	.....	.....	135.2	108.3
Rubber prod. employment *i*	.....	.....	.....	.....	100.8	88.0
Rubber prod. payrolls *i*	.....	.....	.....	.....	113.9	88.4
Dyeing and fin. employment *i*	.....	.....	.....	.....	139.8	130.1
Dyeing and fin. payrolls *i*	.....	.....	.....	.....	129.2	109.2
MISCELLANEOUS:						
Oils & Fats Index ('26 = 100)[1]	110.2	61.8	93.7	59.9	83.6	61.8
Gasoline prod., *p*	.....	.....	48,606	44,607	42,253	47,596
Cottonseed oil consumpt., bbls.	.....	.....	314,505	243,671	306,551	214,583
PAINT, VARNISH, LACQUER, FILLERS:						
Sales 680 establishments, dollars	$51,963,528	$37,656,398	$40,185,294	$31,592,093	$33,690,870	$26,537,573
Trade sales (580 estbts.) dollars	$27,972,286	$20,188,957	$19,565,515	$16,144,606	$15,767,081	$13,042,764
Industrial sales, total, dollars	$19,266,308	$13,849,723	$17,033,354	$12,639,821	$14,973,684	$11,146,277
Paint & Varnish, employ. *i*	.....	.....	.....	.....	128.8	123.2
Paint & Varnish, payrolls *i*	.....	.....	.....	.....	142.0	128.3

a Bureau of Mines; *b* Crude and refined plus motor benzol, Bureau of Mines; *c* Based on 1 lb. of gun cotton to 7 lbs. of solvent, making an 8-lb. jelly; *d* 000 omitted, Bureau of Foreign & Domestic Commerce; *e* Expressed in equivalent tons of 16% A.P.A.; *f* 000,000 omitted at end of month; *i* U. S. Dept. of Labor, 3 year average, 1923-25 = 100, adjusted to 1937 Census totals; *j* 000 omitted. 37 states; *p* Thousands of barrels, 42 gallons each; *q* 680 establishments, Bureau of the Census; *r* Classified sales, 580 establishments, Bureau of the Census; *s* 53 manufacturers, Bureau of the Census; *t* 387 identical manufacturers, Bureau of the Census, quantity expressed in dozen pairs; *v* In thousands of bbls., Bureau of the Census; ** Indices, Survey of Current Business, U. S. Dept. of Commerce; *z* Units are millions of lbs.; ‡ 000 omitted; *New series beginning March, 1940; [1] Revised series beginning February, 1940.

Chemical Fund Report

Net assets of Chemical Fund, Inc., at March 31, 1941, the end of the company's fiscal year, taking securities at market value, amounted to $7,852,061, representing an asset value and liquidating value of $8.69 per share on 903,214 shares of the company's stock outstanding, according to the annual report out yesterday. On March 31, 1940, net assets totaled $8,378,323, equivalent to $10.81 per share on 774,395 outstanding shares. The change in asset and liquidating value was in line with the decrease in the levels of security prices generally, according to the letter to stockholders which accompanied the report.

Columbian Earns $2.03

Consolidated net income of Columbian Carbon Co. in the first quarter of 1941, was $1,089,335 or 2.03 per share, compared with $1,018,639, equal to $1.90 per share, in the corresponding period of 1940. In the 1941 quarter income, it was pointed out, there was a non-recurring profit of $12,699, equal to 2c per share. In the 1940 first quarter there was a non-recurring profit of $185,379, or 34c per share. Sales of the company in the three months ended March 31 were up 23 per cent over those of the corresponding period in 1940.

United Carbon Nets $1.35

Improvement in the carbon black and natural gas divisions in the first quarter of this year was reflected in an increase in net profits of United Carbon Co. of approximately 10 per cent. compared with the similar period of 1940.

The better profits, too, were in spite of the setting up of additional reserves for federal taxes at expected higher levels.

Net income was in the neighborhood of $550,000 after all charges for the March period, which would be equal to around $1.35 a share on the 397,885 shares of no par capital stock outstanding. This would compare with $495,184 earned in the corresponding period of 1940, equal to $1.24 a share.

Earnings Statements Summarized

Company:	Annual dividends	Net income 1941	Net income 1940	Common share earnings 1941	Common share earnings 1940	Surplus after dividends 1941	Surplus after dividends 1940
American Commercial Alcohol Corp.:							
March 31 quarter	*f* ...	$ 65,018	$ 51,475	$ .25	$ .19	.....	.....
American Cyanamid Co.:							
March 31 quarter	*x*$ .60	1,697,372	1,467,158	.60	.53	.....	.....
American Viscose Corp.:							
Year, December 31	¶ .50	7,884,676	4,057,164	*u*3.85	*u*1.63	.....	.....
Celanese Corp. of America:							
March 31 quarter	*x* 1.25	1,587,755	2,419,414	*h*.84	*h*1.64	.....	.....
Twelve months, March 31	*x* 1.25	5,738,055	7,456,801	*h*2.87	*h*4.48	.....	.....
Columbian Carbon Co.:							
March 31 quarter	*y* 4.60	1,089,336	1,018,639	2.03	1.90	$551,930	$481,233
Formica Insulation Co.:							
March 31 quarter	*y* 1.50	122,617	115,519	.75	.70	.....	.....
Glidden Co.:							
Six months, April 30	*y* 1.00	1,033,811	614,933	.99	.47	.....	.....
Twelve months, April 30	*y* 1.00	2,146,707	2,102,335	2.07	2.00	.....	.....
International Nickel Co.:							
March 31 quarter	*y* 2.00	9,239,709	9,820,114	.60	.64	1,467,150	2,047,555
Merck & Co., Inc.:							
March 31 quarter	¶ 2.60	1,057,481	*.....	1.09	....	.....	.....
Sharp & Dohme, Inc.:							
March 31 quarter	*w* .20	351,701	303,687	.19	.13	.....	.....
Twelve months, March 31	*w* .20	1,222,916	1,023,931	.54	.29	.....	.....
United Carbon Co.:							
March 31 quarter	*y* 3.00	540,028	495,184	1.36	1.24	241,614	196,770
Vick Chemical Co.:							
March 31 quarter	*y* 3.00	625,066	595,655	.92	.86	.....	.....
Nine months, March 31	*y* 3.00	2,576,887	2,546,685	3.78	3.66	.....	.....

a On Class A shares; *b* On Class B shares; *c* On Combined Class A and Class B shares; *d* Deficit. *f* No common dividend; *j* On average number of shares; *k* For the year 1940; *p* On Preferred stock; On Class A shares; *y* Amount paid or payable in 12 months to and including the payable date of the most recent dividend announcement; ‡ Indicated quarterly earnings as shown by comparison of company's reports for the 6 and 9 months periods; § Plus extras; *n* Preliminary statement; *h* On shares outstanding at close of respective periods. ** Indicated quarterly earnings as shown by comparison of company's reports for 1st quarter of fiscal year and the six months period. ‡‡ Indicated earnings as compiled from quarterly reports. † Net loss. * Not available. ¶¶ Before interest on income notes. *x* Paid on or declared in last 12 months plus extra stock. *w* Last dividend declared, period not announced by company.

Price Trend of Representative Chemical Company Stocks

	May 3	May 10	May 17	May 24	May 31	Net gain or loss last mo.	Price on June 1 1940	1941 High	1941 Low
Air Reduction Co.	38	39¼	39¼	40	39¾	+1¾	39	42½	35¾
Allied Chemical & Dye	146¾	150	149¾	149	146	— ¾	142	165	144½
Amer. Agric. Chem.	15⅜	16½	16⅜	17¼	17⅛	+2	14	17¾	14⅜
American Cyanamid "B"	34½	36	36	36⅞	35¾	+1¼	30⅝	38	31
Columbian Carbon	72	72	75	76	75	+3	72	80⅛	69⅞
Commercial Solvents	9¾	10⅛	9⅞	9⅝	9¾	...	9	11½	8⅜
Dow Chemical Co.	126	123	124	124	124	—2	140	141¾	120
du Pont de Nemours	139⅜	141	141	143¼	143	—4⅝	156	164¾	138
Hercules Powder Co.	68	69½	68	66¾	68½	+ ½	81	77½	66
Mathieson Alkali	25	24¾	24⅞	24¾	25¾	+ ¾	23½	30	24⅛
Monsanto Chemical Co.	78¾	79¼	78⅝	79⅞	78	— ¾	89¼	88½	77
Standard Oil of N. J.	36⅛	36¾	36⅜	37⅛	37	+ ⅞	30⅜	38¼	33
Texas Gulf Sulphur	33½	35⅛	34½	34⅛	34	+ ½	29½	38	31½
Union Carbide & Carbon	65	67	66⅞	69	69	+4	63¼	70⅞	60
U. S. Industrial Alcohol	21½	22¾	22	23	22½	+1	15⅝	28¾	20

Dividends and Dates

Name	Per Share	Payable	Stock Record
Abbott Laboratories quar.	$0.40	June 30	June 12
Extra	.10	June 30	June 12
4½% pref. quar.	1.125	July 15	July 1
Allied Chemical & Dye quar.	1.50	June 20	June 6
American Agricultural Chemical Co.	.30	June 3	June 16
American Cyanamid Co. Class A quar.	.15	July 1	June 12
Class B quar.	.15	July 1	June 12
5% conv. pref. 1st series quar.	.125	July 1	June 12
5% pref. 2nd series quar.	.125	July 1	June 12
5% pref. 3rd series quar.	.125	July 1	June 12
Borne-Scrymser Co.	2.00	June 14	May 29
Climax Molybdenum Co. quar	.30	June 25	June 17
Colgate-Palmolive-Peet pref. quar.	1.06¼	June 30	June 10
Columbian Carbon Co. quar.	1.00	June 10	May 23
Commercial Solvents Corp.	.25	June 30	June 6
du Pont de Nemours & Co. interim	1.75	June 14	May 26
Eastman Kodak Co. quar.	1.50	July 1	June 5
pref. quar.	1.50	July 1	June 5
General Printing Ink Corp.	.15	July 1	June 17
$6 pref. quar.	1.50	July 1	June 17
Hooker Electrochemical Co., 6% pref. quar.	1.50	June 30	June 12
Koppers, 6% pref. quar.	1.50	July 1	June 13
Monroe Chemical Co. quar.	.875	July 1	June 14
Mutual Chemical Co. of America 6% pref. quar.	1.50	June 28	June 19
6% pref. quar.	1.50	Sept. 27	Sept. 18
6% pref. quar.	1.50	Dec. 27	Dec. 18
Procter & Gamble Co. 5% pref. quar.	1.25	June 14	May 23
U. S. Potash Co.	.50	June 30	June 14
6% pref. quar.	1.50	June 16	June 2
United Carbon Co.	.75	July 1	June 14
Vick Chemical Co. quar.	.50	.....	.....
Extra	.10	.....	.....
Special Fiscal year end	.60	.....	.....
Victor Chemical Works	.30	June 30	June 20

International Nickel Earnings Drop

International Nickel Co. of Canada, Ltd., and subsidiaries in report for quarter ended March 31, 1941, show net profit (stated in terms of United States currency) of $9,239,709 after depreciation, depletion, income taxes, etc., equivalent after dividend requirements on 7 per cent. preferred stock, to 60 cents a share on 14,584,025 no-par shares of common stock.

This compares with $9,820,114 or 64 cents a common share in March quarter of previous year.

General Aniline Dividend Is $5.59

General Aniline & Film Corporation, according to the annual report mailed to stockholders, had consolidated net earnings in the year ended December 31, 1940, of $4,106,057, equal to $5.59 per common A share and 56c per common B share.

This compares with consolidated net earnings for the year ended December 31, 1939, of $4,463,601, equal to $5.38 per common A share and 54c per common B share, on a larger number of B shares outstanding at the close of 1939.

Chemical Finances

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Chemical Stocks and Bonds

May 1941 Last	PRICE RANGE 1941 High	1941 Low	1940 High	1940 Low	1939 High	1939 Low	Sales	Stocks	Par $	Shares Listed	Dividends 1940*	Earnings** $-per-share-$ 1940	1939	1938
NEW YORK STOCK EXCHANGE							Number of shares May 1941	1941						
47¼	53	46	70¼	49¼	71½	53	2,300	12,000	Abbott Labs.	No	755,204	2.15	2.89	2.61	2.43
39¼	42½	35¾	58⅛	36½	68	45¾	25,200	132,500	Air Reduction	No	2,711,137	1.75	2.38	1.98	1.47
145¾	165	144½	182	135½	200¼	151½	7,100	33,200	Allied Chem & Dye	No	2,401,288	6.00	9.43	9.50	5.92
17	17¾	14⅜	21	12½	24½	16	6,400	27,000	Amer. Agric. Chem.	No	627,981	1.20	1.45	1.22	2.23
4⅞	6⅛	4⅝	8¼	4¼	11⅞	5½	800	18,900	Amer. Com. Alcohol	No	280,934	...	.22	—.38	—2.05
27	30	26	35½	33	37	21	1,600	5,800	Archer-Dan.-Midland	No	545,416	1.40	5.71	3.82	.43
61	72¼	61	80½	57	71	50	700	4,200	Atlas Powder Co.	No	252,278	4.25	5.71	3.82	2.69
113¾	118½	111	124¾	112½	127	116	410	1,560	5% conv. cum. pfd.	100	68,597	5.00	26.01	18.94	14.77
19⅛	28⅝	18⅞	35½	20	30¼	13⅝	8,900	58,300	Celanese Corp. Amer.	No	1,112,788	1.25	3.38	3.53	.20
118	120¾	116¾	121	105½	109⅞	84	1,460	7,100	prior pfd.	100	164,818	7.00	38.69	38.67	15.05
13¼	13¼	11⅛	20	10⅜	18	11½	18,800	70,200	Colgate-Palm.-Peet	No	1,962,087	1.00	1.72	2.74	1.77
73	80⅛	69⅞	98¾	71	96	73	900	8,000	Columbian Carbon	No	537,406	4.60	5.71	5.32	5.13
9¾	11½	8⅝	16⅝	8	16	8⅝	22,000	158,200	Commercial Solvents	No	2,636,878	.25	.91	.61	—.11
46	47½	42¼	65⅛	40¼	67½	54⅞	12,800	76,900	Corn Products	25	2,530,000	3.00	3.10	3.32	3.18
171¼	182½	170	184	165	177	150	950	3,480	7% cum. pfd.	100	245,738	7.00	38.99	41.18	30.69
14	17¼	13	23⅛	12½	32¾	18	1,310	11,750	Devoe & Rayn. A.	No	95,000	.25	1.14	2.08	—1.72
122	141¾	120	171	127¼	144¾	101½	2,500	17,700	Dow Chemical	No	1,135,187	3.00	6.65	3.76	3.91
143	164¾	138	189¼	146½	188½	126¼	20,100	125,200	DuPont de Nemours	20	11,065,762	7.00	7.23	7.70	3.74
123¼	125⅞	120⅞	129⅝	114	124½	112	2,600	13,750	4½% pfd.	100	1,688,850	4.50	51.48	52.25	87.27
121½	142	120¼	166¾	117	186½	138½	9,800	39,800	Eastman Kodak	No	2,488,242	6.00	7.96	8.55	7.54
170	182½	160	180	155	183½	155½	190	1,510	6% cum.	100	61,657	6.00	325.62	337.65	281.22
32½	39	32½	39¼	24¾	36	18¼	10,900	44,300	Freeport Sulphur	10	796,380	2.00	3.81	2.76	1.87
6¼	7½	6	10	5½	10⅞	7	2,400	11,900	Gen. Printing Ink	1	735,960	.60	.86	.94	.62
14½	14¾	12¾	19⅝	11	24½	14	8,600	42,900	Glidden Co.	No	829,989	1.00	1.56	1.70	—.29
42¾	46	40¼	45	30	47	34	1,400	5,100	4½% cum. pfd.	50	199,940	2.25	8.64	9.27	1.03
80½	95	80	113¼	89⅞	113¾	93	1,000	4,900	Hazel Atlas	25	434,409	5.00	5.98	6.60	4.97
68	77½	66	100½	69	101½	63	3,100	22,200	Hercules Powder	No	1,316,710	2.85	4.01	3.65	1.95
125¼	128¼	123½	133½	126¼	135½	128½	80	2,010	6% cum. pfd.	100	96,194	6.00	66.38	60.87	35.31
21	26	20⅝	29	16⅜	29½	16⅝	3,500	23,500	Industrial Rayon	No	759,325	2.00	3.15	1.77	.24
20⅝	25½	19½	47⅜	21¼	46¼	17½	2,200	9,600	Interchem.	No	290,320	1.60	2.47	4.10	.32
110	113¼	109	113	91	109½	90	190	1,950	6% pfd.	100	65,661	6.00	16.99	24.27	7.39
1½	2⅛	1¼	2½	1	3⅝	1½	1,900	22,600	Intern. Agricul.	No	436,048	...	...	—1.32	—0.003
37	49	30⅛	44	18½	41	16	600	15,300	7% cum. pfd.	100	100,000	...	...	1.26	7.01
24¾	28½	23⅜	38⅞	19⅝	55¾	35	64,600	334,200	Intern. Nickel	No	14,584,025	2.00	2.30	2.39	2.09
41	42½	38¼	39⅝	26⅞	38	29	800	5,300	Intern. Salt	No	240,000	2.50	3.98	1.92	2.29
17¾	20¾	17¾	23⅜	14⅝	22½	14½	800	4,400	Kellogg (Spencer)	No	509,213	1.60	...	1.39	.71
28⅛	45⅝	28⅛	53⅜	30	56¾	36½	15,300	86,400	Libbey Owens Ford	No	2,513,258	3.50	3.97	3.21	1.57
14⅛	16⅝	13	18⅜	10¼	19	13½	5,400	20,900	Liquid Carbonic	No	700,000	1.00	1.72	1.62	1.81
25¾	30	24⅛	32¾	21	37⅝	20¾	2,500	16,900	Mathieson Alkali	No	828,171	1.50	1.72	1.12	1.01
78	88½	77	119	79	114⅝	85¾	3,800	33,000	Monsanto Chem.	No	1,241,816	3.00	4.04	3.81	2.35
116⅛	117	112	119	110	121	110	210	1,640	4½% pfd. A.	No	50,000	4.50	57.38	54.29	31.51
117½	120	115	122	113½	122½	112	180	1,490	4½% pfd. B.	No	50,000	4.50	57.38	54.29	31.51
15½	17¾	14½	22½	14⅛	27½	17⅞	14,200	81,900	National Lead	10	3,095,100	.87	1.34	1.23	.75
169	176	168½	176	160	173⅛	152	500	2,500	7% cum. "A" pfd.	100	213,793	7.00	28.54	27.04	20.03
143	154	142	153⅜	132	145	133	380	1,120	6% cum. "B" pfd.	100	103,277	6.00	59.46	55.30	35.97
27¼	31	26	44	28¾	46	28½	1,300	14,700	National Oil Products	4	179,829	1.35	3.92	3.89	2.23
6	8¾	5⅜	14¼	6⅛	17⅝	8½	6,900	43,000	Newport Industries	1	621,359	.30	.50	.66	—.08
39⅞	49¼	38¾	64⅝	42	70	50	16,900	76,300	Owens-Illinois Glass	12.50	2,661,204	2.00	2.71	3.17	2.02
50½	58¼	50⅛	71⅝	53	66	50⅝	22,500	76,700	Procter & Gamble	No	6,409,418	2.75	4.37	3.80	2.50
116	119½	116	118½	112½	119⅝	112	90	1,310	5% pfd.	100	169,517	5.00	336.78	298.55	101.81
14¼	15	10⅛	13⅛	7⅝	17¼	9⅞	37,200	111,500	Shell Union Oil	No	13,070,625	.75	1.05	.77	.70
27¼	28¾	18⅞	23¼	13¼	29½	15¼	23,900	51,500	Skelly Oil	No	981,349	1.25	3.28	1.99	2.27
28½	31	25½	29	20⅝	30	22¾	91,200	286,300	S. O. Indiana	25	15,272,020	1.50	2.20	2.24	1.82
36½	38¼	33	46½	29⅞	53½	38	237,000	677,500	S. O. New Jersey	25	26,618,065	1.75	...	3.27	2.86
7½	9¼	7⅜	9¼	4¾	9½	4	2,300	28,600	Tenn. Corp.	5	853,696	.25	1.36	.41	.40
39¼	40⅝	34½	47⅝	33	50⅜	32½	78,200	283,100	Texas Corp.	25	10,876,882	2.00	...	3.02	2.13
33	38	31½	37¼	26⅞	38½	26	15,300	71,200	Texas Gulf Sulphur	No	3,840,000	2.50	2.38	2.04	1.81
68⅞	70⅞	60	88⅝	59⅞	94¼	65½	44,200	211,500	Union Carbide & Carbon	No	9,277,288	2.30	4.55	3.86	2.77
43	50½	40⅞	65⅝	42½	60¼	52	4,000	14,500	United Carbon	No	397,885	3.00	3.36	3.81	3.78
22½	28¾	20	28	14	29⅝	13½	4,100	36,600	U. S. Indus. Alcohol	No	391,238	...	...	.20	—1.08
23⅝	34⅛	23	43⅞	25	40	16	11,700	66,200	Vanadium Corp. Amer.	No	377,140	1.50	...	3.25	.61
22	24¾	20	31⅛	19	29¾	18¼	1,400	7,600	Victor Chem.	5	696,000	1.40	1.45	1.59	1.05
1⅝	2½	1½	4¼	1⅜	5⅜	2¼	1,500	13,300	Virginia-Caro. Chem.	No	486,122	...	...	—1.57	—1.80
21¼	27¼	19¼	31⅜	14	33⅜	17	2,900	13,200	6% cum. part. pfd.	100	213,052	...	...	2.41	1.90
29	36	27¼	38½	27⅜	39¼	15¼	1,800	6,300	Westvaco Chlorine	No	353,152	1.85	2.96	2.91	1.52
108	110¼	105	109⅞	108	...	...	720	2,920	cum. pfd.	No	60,000	4.50	...	...	...
NEW YORK STOCK EXCHANGE															
35¾	38	31	39⅞	26	35¾	18⅝	22,200	126,000	Amer. Cyanamid "B"	10	2,618,387	1.10	2.44	2.07	.91
107½	134	107¼	134⅞	98	112¾	76	1,125	7,425	Celanese, 7% cum. 1st pfd.	100	148,179	9.72	35.25	35.73	8.95
4⅜	5½	4	6¾	2⅜	6¾	3	100	9,000	Celluloid Corp.	15	194,952	...	—.29	.70	—2.73
7	7¾	6⅜	8½	5	9¼	5	100	4,800	Duval Texas Sulphur	No	500,000	.75	1.16	1.25	.71
70¼	77¾	65	92	60	68	30	150	3,250	Heyden Chem Corp.	100	125,497	3.00	...	5.98	2.07
73¾	96¼	73¾	104	65	117	90	5,800	23,700	Pittsburgh Plate Glass	25	2,188,040	5.00	6.30	4.94	3.00
68½	80⅛	65	106	62½	113½	81	3,700	20,250	Sherwin Williams	25	638,927	3.00	...	5.96	2.43
110	115½	109	114⅝	106	116	106½	260	1,520	5% cum. pfd.	50	132,189	5.00	...	35.08	3.76
PHILADELPHIA STOCK EXCHANGE															
165	182	162	192	158¾	179	135	400	1,600	Pennsylvania Salt	50	150,000	9.00	...	10.52	6.29

May 1941 Last	PRICE RANGE 1941 High	1941 Low	1940 High	1940 Low	1939 High	1939 Low	Sales	Bonds	Date Due	Int. %	Int. Period	Outstanding $
NEW YORK STOCK EXCHANGE							May 1941	1941				
103¾	104½	100¾	105¼	100¼	103¾	98	538,000	1,171,000	Amer. I. G. Chem. Conv.	1949	5½	M-N	$22,400,000
28¾	35	26⅛	41	27½	41½	19	27,000	225,000	Anglo Chilean Nitrate inc. deb.	1967	4½	J	10,400,000
27¼	33½	25⅝	39¾	27	37	21½	120,000	436,000	Lautaro Nitrate inc. deb.	1975	4	J-D	27,200,000
31	38	31	40	21	30	16	...	3,000	Ruhr Chem.	1948	6	A-O	1,500,000
97¼	99¾	94¾	100¼	93½	95¾	88¾	396,000	2,231,000	Shell Union Oil	1954	2½	J-J	85,000,000
104¼	106½	103⅜	107	101¼	106¼	97¾	158,000	824,000	Standard Oil Co. (New Jersey) deb.	1961	3	J-D	85,000,000
103¾	105⅝	103	107	100⅝	106½	94¼	209,000	1,079,000	Standard Oil Co. (New Jersey) deb.	1953	2¾	J-J	50,000,000
106	106⅞	102⅞	106¼	102	105⅞	95¼	238,000	735,000	Texas Corp.	1959	3	A-O	40,000,000

* Including extras paid in cash.

** For either fiscal or calendar year.

New Trade Marks of the Month

DOUBLY DEOXIDIZED
386,615

Zeinlac
386,876

423,007

425,860

428,331

G-NUT
430,479

SLIK
430,760

432,576

433,260

VULCAN.
434,119

RAOLIN
434,222

Wyandotte
APACHE
436,428

436,522

CEDAR-SAN
436,804

437,241

437,466

NU-SHEEN
438,168

VALOSA
438,672

438,819

ANTISOL
438,837

CAL-RHIZ
439,052

439,093

ALOX
439,422

ALOX
439,425

PERMASEAL
439,478

CAUSPLIT
439,662

DENZYLOR
439,673

GELLOID
439,814

MELMAC
440,080

440,105

440,107

MEATEX
440,137

MORKAZO
440,239

LAVCO
440,263

MILARSENITE
440,270

MIRACLE BLEACH
440,493

CHROMOLAN
440,518

LUR-cm
440,661

Alpaka
440,692

Trade Mark Descriptions†

386,615. Titan Metal Manufacturing Company, Bellefonte, Pa.; Oct. 2, '39; for welding rods; since Dec., 1932.

386,876. Fred'k A. Stresen-Reuter, Inc., Chicago, Ill.; May 19, '39; for liquid solution consisting of zein and diethylene glycol; since Dec. 1, '38.

423,007. Sharp & Dohme, Inc., Philadelphia, Pa.; Aug. 25, '39; for wares, ordinarily and commercially described as pharmaceutical and medicinal goods, wares, products, and preparations, for internal and external use; since Oct. 15, '38.

425,860. Protex Industries, Inc., New York, N. Y.; Nov. 21, '39; for latex and toxic latex as a coating for trees, plants, and other products; since Oct., '36.

428,331. Louis S. Richman (Reliable Cement Mfg. Co.), New York, N. Y.; Feb. 7, '40; for quick drying adhesive cement; since Jan. 10, '40.

430,479. The Bergen Co., Inc., Clearwater, Fla.; Apr. 8, '40; for tung oil for external application for the alleviation of cuts, wounds, and burns; and for internal use as a laxative; and tung tea for external application for the alleviation of cuts, wounds, and burns, and for internal use as a stimulant and regulator; since Mar. 27, '40.

430,760. Claire Manufacturing Co. (Claire Mfg. Co.), Chicago, Ill.; Apr. 15, '40; for cleaning compounds for the skin, and for fabric, glass, and painted surfaces; since June 1, '29.

432,576. Givaudan-Delawanna, Inc., New York, N. Y.; June 1, '40; for organic odoriferous and flavor-imparting chemicals; since Aug. 15, '39.

433,260. Orefraction Incorporated, Pittsburgh, Pa.; June 21, '40; for minerals and ore concentrates; since May 14, '40.

434,119. Jonkopings Och Vulcans Tandsticks–Fabriksaktiebolag, Jonkoping, Sweden; July 18, '40; for matches; since 1872.

434,222. The Raolin Corporation, New York, N. Y.; July 22, '40; for chlorinated rubber and compositions such as resins containing the same; since Sept. 20, '37.

436,428. The J. B. Ford Company, Wyandotte, Mich.; Sept. 27, '40; for cleaning, cleansing, and detergent preparation; since August, '40.

436,522. P. C. Products Company, St. Louis, Mo.; Sept. 30, '40; for composition for killing rodents; since Sept. 26, '40.

436,804. Huntington Laboratories, Inc., Huntington, Ind.; Oct. 10, '40; for dust layer oil and preservative in the nature of a floor sweeping compound; since 1925.

437,241. Filtrex Company, Inc., Elizabeth, N. J.; Oct. 24, '40; for compound designed for prevention of scale, pitting and corrosion where metal surfaces are exposed to steam and water; since Aug. 21, '39.

437,466. Dominant Products Co., Inc., New York, N. Y.; Nov. 1, 1940; for metal polishing preparation and for soaps and detergents; since Feb. 1, '36.

438,168. Continental Car-Na-Var Corporation, Brazil, Ind.; Nov. 22, '40; for liquid polish for furniture and automobiles; since July 23, '28.

438,672. Thompson-Hayward Chemical Company, Kansas City, Mo.; Dec. 9, '40; for phosphates, soda compounds, pine oil, phosphoric acid, starch, sodium metacylicate for technical, not food purposes; since Aug., '39.

438,819. Vitamin Technologists, Inc., Los Angeles, Calif.; Dec. 13. '40; for activated ergosterol dissolved in sesame oil; since April, '40.

438,837. The Gevaert Company of America, Inc., New York, N. Y.; Dec. 14, '40; for colored acetate sheets designed to absorb a portion of the sun's spectrum or of the spectrum of other illuminants; since Dec. 3, '40.

439,052. John H. Nelson (Nelson Laboratories), Stockton, Calif.; Dec. 20, '40; for nitrogen fixing bacteria for legume seed inoculation; since Mar. 21, '40.

439,093. Carnegie Dock & Fuel Company, Minneapolis, Minn.; Dec. 23, '40; for high volatile premium bituminous coal; since Aug. 30, '40.

439,422. Alox Corporation, Niagara Falls, N. Y.; Jan. 6, '41; for lubricating oils and greases, and penetrating lubricating oils; since July 1, '30.

439,425. Alox Corporation, Niagara Falls, N. Y.; Jan. 6, '41; for oxidized petroleum hydrocarbon masses in paste to liquid form; since Jan. 2, '30.

439,478. A. D. Chapman & Company, Inc., Chicago, Ill.; Jan. 8, '41; for chemical preparation for preserving and water-proofing wood, fabric and other cellulosic materials; since Dec. 27, '40.

439,662. Pennsylvania Salt Manufacturing Co., Philadelphia Pa.; Jan. 14, '41; for acid and alkali-proof building cements; since Nov. 13, '40.

439,673. E. R. Squibb & Sons, New York, N. Y.; Jan. 14, '41; for oral preparations for use as dentifrices and mouth washes; since Jan. 6, '41.

439,814. Maryland Colloid Co., Baltimore, Md.; Jan. 21, '41; for external antiphlogistic absorbent for horses, cattle, and dogs for allaying pain and reducing inflammation, or poultice material; since Jan. 1, '41.

440,080. American Cyanamid Company, New York, N. Y.; Jan. 29, '41; for condensation products of aldehydes and amines—namely, synthetic resins and compositions thereof; since Dec. 12, '40.

440,105. The Visking Corp., Chicago, Ill.; Jan. 20, '41; for seamless cellulose tubes; since Jan. 9, '41.

440,107. The Visking Corp., Chicago, Ill.; Jan. 29, '41; for sausage casings made of cellulose; since June 1, '30.

440,137. Stein-Hall Manufacturing Co., Chicago, Ill.; Jan. 30, '41; for wheat endosperm, a pure cereal product in granular form used as a binder ingredient in prepared food specialties; since Feb. 8, '40.

440,239. George W. Fillauer, Chattanooga, Tenn.; Feb. 3, '41; for ointment containing cod liver oil and zinc oxide; since Aug. 1, '40.

440,263. S. Pfeiffer Mfg. Co. (Maldehyde Chemical Co.), St. Louis, Mo.; Feb. 3, '41; for medicinal products and preparations; since Dec. 16, '36.

440,270. Sewage Commission of the City of Milwaukee, Milwaukee, Wis.; Feb. 3, '41; for artificial fertilizers; since Jan. 22, '41.

440,493. Crown Products Corp., Los Angeles, Calif.; Feb. 10, '41; for bleaching water; since Dec. 1, '40.

440,518. National Aniline & Chemical Company, Inc., New York, N. Y.; Feb. 10, '41; for dyes, dyestuffs and colors in the nature of textile dyes; since Dec. 16, '41.

440,661. Peride Products, Inc., Brooklyn and New York, N. Y.; Feb. 14, '41; for insecticides; since Jan. 7, '40.

440,664. The Sherwin-Williams Company, Cleveland, O.; Feb. 14, '41; for naphthalene acetic acid spray; since June 13, '40.

440,692. Merz & Co. Chemical Works, Inc., East Orange, N. J.; Feb. 15, '41; for chemical compound containing liquid aluminum aceto-tartrate used as an astringent and antiphlogistic agent in medicinal preparations; since Oct. 22, '31.

† Trademarks reproduced and described include those appearing in *Official Gazette* of the U. S. Patent Office, Apr. 15–May 13, 1941.

New Trade Marks of the Month

CADURA
440,708

"WONDER PUTTY"
440,711

EXYLIN
440,726

PROLON
440,833

BARONES
440,877

POSMAX
440,878

AROCASCARA
440,886

AHCOPRINT
440,903

POLYFORM
440,986

HYDRO-SEAL
441,015

URECHOLINE
441,027

SUPERKLEEN BSW Dry Cleaning Fluid
441,038

PEAK
441,048

PEAK
441,049

CITRIFOAM
441,052

AMSCO-SOLV
441,119

KLEENAPART
441,185

TRI-NUTRON
441,212

88
441,272

SANDOZOL
441,291

METLBOND
441,310

TINQUIM
441,388

COP-FIX
441,395

NITROGATION AMMONIA
441,416

R-A-L.
441,443

MEGALIN
441,469

MARATHON
441,485

LISEX
441,497

I L R
441,512

SYNTHEPLEX-B
441,553

WARCOSOL
441,595

AMERICAN
441,617

441,618

HEMONUTRON
441,624

BUCKEYE
441,630

AQUAFIX
441,655

AQUAPHOS
441,656

PLAXOL
441,696

Porcenell
441,746

MAGIC FLUX
441,748

MENESTRIN
441,769

STILBIOTIN
441,791

DAYAMIN
441,802

NITROGANIC
441,992

DELAC
442,080

SURPLEX
442,087

SYNTOPHEROL
442,088

VICOMPLIN
442,089

440,708. Standard Brands, Inc., New York, N. Y.; Feb. 15, '41; for coffee improver, particularly a yeast-containing composition for facilitating the fermentation of pulped coffee in its preparation for market; since Dec. 3, '40.

440,711. Atlas Putty Products Co., Chicago, Ill.; Feb. 17, '41; for plastic sealing compound in the nature of a putty; since Jan. 7, '41.

440,726. McCoy, Jones & Company, Inc., Chicago, Ill.; Feb. 17, '41; for containers made of plastic material; since May 23, '40.

440,833. Pro-Phy-Lac-Tic Brush Co., Northampton, Mass.; Feb. 20, '40; for artificial filaments and plastic sheet material; since Aug. 23, '40.

440,877. Daniel Garcia Posadas, Buenos Aires, Argentina; Feb. 21, '41; for casein; since Mar. 29, '40.

440,878. Daniel Garcia Posadas, Buenos Aires, Argentina; Feb. 21, '41; for casein; since June 17, '40.

440,886. Sharp & Dohme, Inc., Philadelphia, Pa.; Feb. 21, '41; for stimulants, cathartics, laxatives, aperients, chologogues, eliminants, evacuants; since Jan. 16, '41.

440,903. Arnold Hoffman & Co., Inc., Providence, R. I.; Feb. 25, '41; for chemical products for use in processing textiles; since Jan. 30, '41.

440,986. Gulf Oil Corporation, Pittsburgh, Pa.; Feb. 25, '41; for gasoline and gasoline-like motor fuels; since Feb. 4, '41.

441,015. The Curran Corporation, Malden, Mass.; Feb. 26, '41; for decarbonizing and degumming liquid detergent for cleaning compound; since Nov. '39.

441,027. Merck & Co., Inc., Rahway, N. J.; Feb. 26, '41; for medicinal preparation for the treatment of disorders of the peripheral circulatory system and for stimulation of the para-sympathetic nervous system.

441,038. Superkleen Co., New York, N. Y.; Feb. 26, '41; for chemical compound for removing stains; since Nov. 28, '39.

441,048. Commercial Solvents Corp., New York, N. Y.; Feb. 27, '41; for anti-freeze compositions; since Jan. 14, '41.

441,049. Commercial Solvents Corp., New York, N. Y.; Feb. 27, '41; for anti-freeze compositions; since Jan. 15, '41.

441,052. The J. B. Ford Company, Wyandotte, Mich.; Feb. 27, '41; for citrus fruit cleaner; since Dec., '40.

441,119. American Mineral Spirits Co., Chicago, Ill.; Mar. 1, '41; for liquid solvent of petroleum origin and of high aromaticity for use in varnish, paint, and lacquer; since Feb. 7, '41.

441,185. The Selig Company, Atlanta, Ga.; Mar. 3, '41; for liquid metal cleaner; since Sept. 4, '40.

441,212. National Institute of Nutrition, Los Angeles, Calif., and Buffalo, N. Y.; (now Nion Corp.. Mar. 4, '41; for yeast containing vitamin D in powder and tablet form; since Feb. 19, '41.

441,272. The Warner Chemical Company, New York, N. Y.; Mar. 5, '41 for dry cleaning solvents; since Apr. 25, '40.

441,291. Sandoz Chemical Works, Inc., New York, N. Y.; Mar. 6, '41 for leather softening preparations and detergents for use in the textile and leather industries; since May, '33.

441,310. Continental Oil Company, Ponca City, Okla.; Mar. 7, '41; for lubricating oils; since Feb. 19, '41.

441,388. Certified Products, Inc., Washington, D. C.; Mar. 10, '41 for hair dyes; since Mar. 7, '41.

441,395. Russell Farley & Company, Akron, O.; Mar. 10, '41; for insecticides; since Mar. 1, '40.

441,416. Shell Chemical Company, San Francisco, Calif.; Mar. 10, '41; for ammonia for soil fertilizing; since Jan. 19, '41.

441,443. Passaic Analytical Laboratories, Inc., Passaic, N. J.; Mar. 11, '41; for preparation for treatment of poison ivy and athlete's foot; since Aug. 11, '36.

441,469. Difco Laboratories, Inc., Detroit, Mich.; Mar. 12, '41; for pharmaceutical preparation; since Mar. 15, '40.

441,485. The Peerless Carbon Black Company, Pittsburgh, Pa., Mar. 12, '41; for black carbon pigment used in the printing ink, carbon paper and typewriter ribbon industries; since Jan. 14, '32.

441,497. William J. Wardall, New York, N. Y.; Mar. 12, '41; for vitamin products, and particularly a product comprising concentrates of vitamin B, G, B_6 and other filtrates and factors of the vitamin B complex; since Jan. 4, '41.

441,512. International Smelting & Refining Co., Perth Amboy, N. J.; Mar. 13, '41; for refined lead in pigs or blocks, antimonial lead pigs, caulking lead pigs, and lead alloy pigs; since Jan. 8, '35.

441,553. E. R. Squibb & Sons, New York, N. Y.; Mar. 14, '41; for vitaminic preparations since Mar. 3, '41.

441,595. Warwick Chemical Company, West Warwick, R. I.; Mar. 15, '41; for chemical product used for dyeing and finishing fibres, yarns, and fabrics as well as leather and paper; since Jan. 1, '35.

441,617. Metals Disintegrating Co., Inc., Union, N. J.; Mar. 17, '41; for flaked disintegrated metal used as paint ingredient, particularly as paint pigments; since 1873.

441,618. Metals Disintegrating Co., Union, N. J.; Mar. 17, '41; for flaked disintegrated metal used as paint ingredient particularly as paint pigments; since May 27, '39.

441,624. Nion Corporation, Los Angeles, Calif.; Mar. 17, '41; for iron and B. Complex combinations; since Mar. 7, '41.

441,630. The Pure Oil Company, Chicago, Ill.; Mar. 17, '41; for lubricating oil; since July 1, '30.

441,655. The Warner Chemical Company, New York, N. Y.; Mar. 17, '41; for boiler compounds; since Jan. 3, '41.

441,656. The Warner Chemical Company, New York, N. Y.; Mar. 17, '41; for boiler compounds; since Jan. 3, '41.

441,696. Clark-Cleveland, Inc., Binghamton, N. Y.; Mar. 19, '41; for powder for cleaning dental plates; since Jan. 7, '41.

441,746. Poor & Company, Chicago, Ill.; Mar. 20, '41; for chemical materials and compositions for coating metal surfaces for rust-proofing and analogous purposes; since Feb. 26, '41.

441,748. The Ruby Chemical Company, Columbus, O.; Mar. 20, '41; for soldering and tinning flux; since June 1, '41.

441,769. The Harrower Laboratory, Inc., Glendale, Calif.; Mar. 21, '41; for preparation consisting of endothyrin (thyroid iodine 0.62%) Gr. 1/12; estrogenic substance 250 I. U.; anterior pituitary (N.F. VI) Gr. ¼; ovarian residue (N. F. VI) in menstrual disturbances; since Feb. 7, '41.

441,791. E. R. Squibb & Sons, New York, N. Y.; Mar. 21, '41; for estrogenic preparations and preparations containing an estrogenic substance; since Mar. 12, '41.

441,802. Abbott Laboratories, North Chicago, Ill.; Mar. 22, '41; for vitamin preparation; since Mar. 14, '41.

441,992. H. J. Baker & Bro., New York, N. Y.; Mar. 27, '41; for fertilizer; since June 14, '41.

442,080. United States Rubber Company, New York, N. Y.; Mar. 29, '41; for chemicals used as accelerators in the vulcanization of rubber; since May 27, '39.

442,087. Abbott Laboratories; North Chicago, Ill.; Mar. 31, '41; for vitamin preparation; since Mar. 21, '41.

442,088. Abbott Laboratories, North Chicago, Ill.; Mar. 31, '41; for vitamin preparation; since Mar. 21, '41.

442,089. Abbott Laboratories, North Chicago, Ill.; Mar. 31, '41; for vitamin preparation; since Mar. 21, '41.

Coke Production Data, 1940-p. 9

NUMBER OF OVENS, COAL CHARGED, COKE PRODUCED AND AVERAGE YIELD IN 1940, BY STATES

State	Byproduct: Plants	Byproduct: Ovens	Byproduct: Coal used (net tons)	Byproduct: Yield of coke from coal (per-cent)	Byproduct: Coke produced (net tons)	Beehive: Ovens	Beehive: Coal used (net tons)	Beehive: Yield of coke from coal (per-cent)	Beehive: Coke produced (net tons)	Beehive: Value of coke at ovens: Total	Beehive: Value of coke at ovens: ton
Alabama	8	1,254	6,655,710	71.03	4,727,378	380	.....	....	.....	.....	....
Colorado	1	188	849,977	63.95	543,548	255	95,735	65.20	62,417	(1)	(1)
Connecticut	1	61	(2)	(2)	(2)	....	.....	....	.....	.....	....
Illinois	9	916	4,272,533	70.56	3,014,840	....	.....	....	.....	.....	....
Indiana	5	1,450	8,756,244	73.24	6,412,716	....	.....	....	.....	.....	....
Kentucky	1	120	(2)	(2)	(2)	14	(2)	(2)	(2)	(2)	(2)
Maryland	1	361	2,326,483	72.33	1,682,701	....	.....	....	.....	.....	....
Massachusetts	2	215	1,589,587	71.11	1,130,311	....	.....	....	.....	.....	....
Michigan	10	747	4,099,657	70.06	2,872,026	....	.....	....	.....	.....	....
Minnesota	3	196	743,722	70.50	524,360	....	.....	....	.....	.....	....
Missouri	1	64	(2)	(2)	(2)	....	.....	....	.....	.....	....
New Jersey	2	244	1,418,226	71.67	1,016,481	....	.....	....	.....	.....	....
New York	8	978	7,121,369	71.34	5,080,403	....	.....	....	.....	.....	....
Ohio	15	1,862	11,049,203	71.48	7,897,929	....	.....	....	.....	.....	....
Pennsylvania	13	3,351	21,718,501	68.43	14,861,657	11,067	3,997,312	63.80	2,550,367	$10,979,384	$4.31
Rhode Island	1	65	(2)	(2)	(2)	....	.....	....	.....	.....	....
Tennessee	1	24	133,966	70.51	94,454	250	8,818	59.55	5,251	30,298	5.77
Utah	1	56	369,145	59.31	218,949	814	14,537	50.89	7,398	(1)	(1)
Virginia	..	....	.....	....	.....	1,284	330,818	59.97	198,379	943,753	4.76
Washington	..	....	.....	....	.....	160	(2)	(2)	(2)	(2)	(2)
West Virginia	4	387	2,751,565	69.05	1,899,849	926	354,405	65.79	233,154	1,035,665	4.44
Wisconsin	2	195	(2)	(2)	(2)	....	.....	....	.....	.....	....
Combined States	..	....	2,726,872	74.69	2,036,707	....	1,371	62.65	859	3,720	4.33
Undistributed	..	....	.....	....	.....	....	.....	....	.....	483,024	6.92
Total, 1940	89	12,734	76,582,780	70.53	54,014,309	15,150	4,802,996	63.66	3,057,825	13,475,844	4.41
Total, 1939	88	3/12,732	61,215,899	70.05	42,882,313	10,934	2,297,785	62.85	1,444,328	6,426,177	4.45

(1) Included under "Undistributed."
(2) Included under "Combined States."
(3) Revised.

BYPRODUCTS OBTAINED FROM COKE-OVEN OPERATIONS IN THE UNITED STATES IN 1940 [1]

(Exclusive of screenings or breeze)

Product		Production	Sales: Quantity	Sales: Value Total	Sales: Value Average
Tar	gallons	673,286,517	350,691,110	$16,051,496	$ .046
Ammonia:					
Sulfate	pounds	1,436,462,003	1,453,008,364	17,876,168	.012
Ammonia liquor (NH_3 content)	do	56,938,798	56,249,546	1,798,109	.032
		.....	.....	19,674,277	....
Sulfate equivalent of all forms	do	1,664,217,195	1,678,006,548	.....	....
Gas:					
Used under boilers, etc	M cubic feet	[2]/ 833,761,720	36,498,403	2,648,328	.073
Used in steel or affiliated plants	do		305,890,735	31,171,675	.102
Distributed through city mains	do		151,688,271	43,931,892	.290
Sold for industrial use	do		29,563,146	3,650,152	.123
		[2]/ 833,761,720	523,640,555	81,402,047	.155
Light oil and derivatives:					
Crude light oil	gallons	[3]/ 215,213,667	10,324,670	829,031	.080
Benzol, crude and refined	do	31,880,556	31,121,220	3,941,364	.127
Motor benzol	do	101,140,079	95,329,911	8,037,526	.084
Toluol, crude and refined	do	26,406,407	25,918,829	6,282,946	.242
Solvent naphtha	do	5,220,979	4,742,859	754,578	.159
Xylol	do	5,645,993	5,335,574	1,239,603	.232
Other light oil products	do	7,500,617	5,110,041	419,081	.082
		[4]/ 177,794,631	177,883,104	21,504,129	.121
Naphthalene, crude and refined	pounds	72,426,443	72,522,476	1,248,051	.017
Tar derivatives:					
Creosote oil, distillate as such	gallons	27,150,656	16,798,632	1,832,348	.109
Creosote oil in coal-tar solution	do	2,449,812	923,766	114,771	.124
Pitch of tar	net tons	307,040	1,743	11,641	6.679
Other tar derivatives		.....	.....	2,298,328	....
Light carbolic oil	gallons	2,431,293	2,399,778	215,865	.090
Phenol	do	82,045	71,340	29,130	.408
Pyridine, crude and refined	do	241,075	218,165	296,441	1.359
Sodium phenolate	do	168,285	168,287	13,528	.080
Other products [5]/		.....	.....	389,825	....
Value of all byproducts sold		.....	.....	[6]/ 145,081,877	....

[1] Includes products of tar distillation conducted by coke-oven operators under same corporate name, except however, phenol and other tar acids produced at Clairton, Pennsylvania. [2] Includes gas wasted and gas used for heating ovens. [3] Refined on premises to make the derived products shown: 207,272,848 gallons. [4] Total gallons of derived products. [5] Ammonia thiocyanate, asphalt paint, cyanogen, sodium carbolate, sodium prussiate, spent soda solution, sulfur, vented vapors, and a small amount of miscellaneous products. [6] Exclusive of value of breeze production, which in 1940 amounted to $8,472,114.

Coke Production Data, 1940-p. 9

Coke Production Data, 1940-p. 10

CRUDE LIGHT OIL PRODUCED AT COKE-OVEN PLANTS IN THE UNITED STATES AND DERIVED PRODUCTS OBTAINED AND SOLD IN 1940, BY STATES

State	Active plants	Produced (gallons) Total	Produced (gallons) Per ton of coal coked	Refined on premises (gallons)	Derived products obtained and sold: Produced (gallons)	Sold [1] (gallons)	Value [1]
Alabama	7	19,188,504	2.88	18,286,845	16,289,727	15,798,009	$ 1,828,550
Colorado	1	2,797,638	3.29	2,792,736	2,174,373	1,893,917	(2)
Illinois	5	9,229,191	2.43	5,179,801	4,347,082	4,121,179	499,799
Indiana	4	21,770,524	2.63	22,767,872	19,795,334	19,025,465	2,329,776
Maryland	1	7,974,637	3.43	7,959,850	6,870,295	6,526,874	(2)
Michigan	4	10,772,272	2.83	9,130,523	8,222,375	3,938,120	556,202
New York	7	16,996,855	2.69	23,624,814	19,853,527	19,497,611	2,743,833
Ohio	15	33,339,187	3.02	30,174,674	25,190,258	24,622,722	2,976,642
Pennsylvania	11	67,896,978	3.14	66,959,218	57,327,094	54,779,099	6,514,902
Tennessee	1	322,741	2.41	320,632	251,774	215,546	24,236
Utah	1	1,535,729	4.16	1,520,490	1,129,344	1,089,817	(2)
West Virginia	4	9,575,726	3.48	9,972,405	8,458,841	8,139,331	1,215,237
Conn., Ky., Mass., Minn., Mo., N. J, R. I., and Wis.	8	13,813,685	2.52	8,582,988	7,884,607	7,910,744	987,913
Undistributed	..	.....	....	.....	.....	.....	998,008
Grand total, 1940	69	215,213,667	2.93	207,272,848	177,794,631	167,558,434	20,675,098
At merchant plants	25	35,258,257	2.43	29,402,749	25,694,274	24,898,245	3,329,460
At furnace plants	44	179,955,410	3.05	177,870,099	152,100,357	142,660,189	17,345,638
Grand total, 1939	65	170,963,199	2.99	163,947,167	139,805,191	133,435,416	16,306,449

[1] Excludes 10,324,670 gallons valued at $829,032 of crude oil sold as such.
[2] Included under "Undistributed."

By M. M. Otero and M. F. Cooke, Coal Economics Division, F. M. Shore, Acting Chief Engineer.

AMMONIA PRODUCED AT COKE-OVEN PLANTS IN THE UNITED STATES AND SOLD IN 1940

State	Active plants	Produced as — Sulfate (pounds)	Produced as — Liquor (NH_3 content) (pounds)	Sold as — Sulfate Pounds	Sulfate Value	Liquor (NH_3 content) Pounds	Liquor (NH_3 content) Value
Alabama	7	142,256,518	4,386,464	148,289,395	$1,941,917	4,387,056	$ 155,533
Colorado	1	19,939,880	.....	20,370,029	(1)	.....	.....
Illinois	7	66,480,316	4,398,750	69,203,053	785,069	4,149,330	(1)
Indiana	5	138,689,043	4,690,602	133,243,663	1,536,112	4,604,319	152,343
Maryland	1	46,494,302	.....	47,286,890	(1)	.....	.....
Massachusetts	2	32,483,840	1,034,924	30,987,020	(1)	1,038,413	(1)
Michigan	8	36,426,968	12,307,586	34,471,200	383,089	12,014,431	266,321
Minnesota	3	16,780,031	.....	14,995,080	171,910	.....	.....
New Jersey	2	28,628,394	.....	26,772,200	(1)	.....	.....
New York	8	125,269,704	7,481,084	125,649,152	1,689,833	7,413,309	267,756
Ohio	15	202,348,924	9,860,501	207,179,069	2,506,057	9,949,722	353,676
Pennsylvania	11	494,610,483	3,247,872	506,191,490	6,063,539	3,375,494	(1)
Tennessee	1	3,266,803	.....	3,358,800	46,454	.....	.....
Utah	1	10,213,300	.....	10,153,325	(1)	.....	.....
West Virginia	3	52,623,746	.....	54,857,650	764,395	.....	.....
Connecticut, Kentucky, Missouri, Rhode Island, and Wisconsin	5	19,949,751	9,531,015	20,000,348	262,430	9,317,472	296,152
Undistributed	..	.....	.....	.....	1,725,363	.....	306,328
Grand total, 1940	80	1,436,462,003	56,938,798	1,543,008,364	17,876,168	56,249,546	1,798,109
At merchant plants	35	216,764,022	37,580,671	217,111,133	2,795,125	36,590,687	1,222,845
At furnace plants	45	1,219,697,981	19,358,127	1,235,897,231	15,081,043	19,658,859	575,264
Grand total, 1939	80	1,160,548,288	48,264,021	1,153,901,833	13,153,642	48,034,809	1,480,879

[1] Included under "Undistributed."

U. S. Chemical Patents

Off. Gaz.—Vol. 526, Nos. 2, 3, 4—Vol. 527, No. 1—p. 266

A Complete Check—List of Products, Chemicals, Process Industries

Agricultural Chemicals

An agricultural insecticidal composition adapted for use on living plants comprising a compound from the group consisting of phenyl benzyl ether phenyl benzyl ethers having an alkyl substituent on the phenyl group and phenyl benzyl ethers having an aromatically bound nitro group said compound having at least one halogen substituent of a relative weight above thirty attached to an aromatic ring. No. 2,243,479. William F. Hester to Rohm & Haas Co.

Cellulose

Reissue—method making a transparent tube from transparent sheet of cellulose. No. 21,796. Oscar A. Cherry and Charles A. Cabell to Economy Fuse & Manufacturing Co.

Process for preparing high viscosity cellulose ethers. No. 2,241,397. Charles R. Fordyce and Joseph Stampfli to Eastman Kodak Co.

Manufacture of nitrogen derivatives of cellulose. No. 2,241,542. Henry Dreyfus.

Granular article containing cellulose ether and wax. No. 2,241,706. Earle L. Kropscott to The Dow Chemical Co.

Method of making porous articles comprises dissolving an organic derivative of cellulose with the aid of heat and pressure in a liquid containing an active volatile solvent and a liquid precipitating agent in such proportions that under atmospheric temperature and pressure the said liquid has substantially no action on said organic derivative of cellulose quickly releasing the pressure from a substantial mass of the solution. No. 2,242,372. George Schneider to Celanese Corp. of America.

Process for producing porous cellulose derivatives having an increased rate of solubility. No. 2,242,373. George Schneider to Celanese Corp. of America.

Process for producing fast tints on cellulose fibers. No. 2,243,020. Fritz Straub and Walter Hanhart to Society of Chemical Industry.

Process for treating cellulosic material to impart thereto an improved permanent finish. No. 2,243,682. Reginald J. W. Reynolds, Eric E. Walker and Clarence S. Woolvin to Imperial Chemical Industries Ltd.

Process of producing highly stable organic acid esters of cellulose. No. 2,244,295. Merle A. Heath & Ferdinand Schulze to E. I. du Pont de Nemours & Co.

Refractory dental mold for casting alloys. No. 2,243,094. Cornell J. Grossman.

Method and apparatus for the manufacture of hardened glass. No. 2,243,149. Georges P. Despret to The American Security Co.

Porous refractory and process of manufacture. No. 2,243,219. John D. Morgan to Cities Service Oil Company.

Method consisting in preparing a mortar containing substantially kieselguhr lime and and water adding aluminum salt dissolved in sufficient water to raise the water content of the mortar above 70% pouring the mortar in moulds and hardening in steam. No. 2,243,369. Janos Albert.

Method of forming hard cemented carbide products. No. 2,244,052. Gregory J. Comstock.

Hard cemented carbide composite. No. 2,244,053. Gregory J. Comstock.

Ferrous metal enamel. No. 2,244,360. John L. Gallup to Radio Corp. of America.

Heat-absorbing glass and method of producing same. No. 2,244,468. William O. Lytle to Pittsburgh Plate Glass Co.

Ceramics and Refractories

Apparatus for gathering fibers. No. 2,241,405. James F. Hyde and Stuart M. Dockerty to Owens-Corning Fiberglas Corp.

Method treating the surface of glass bodies which consist in positioning the bodies in an annealing lehr, mixing with a fuel oil a material capable of forming an acid gas, thereafter, igniting the fuel oil having the acid gas forming material mixed therewith, and introducing the resulting products of combustion into the lehr. No. 2,241,511. Joseph F. Greene to Kimble Glass Co.

Vitreous enamel containing approximately 63% lead oxide; 31 to 33% silica; between 3 and 4% boric oxide; and approximately 1½% sodium oxide. No. 2,241,520. Victor H. Remington and Ray Andrews to B. F. Drakenfeld & Co., Inc.

One-fire method of manufacturing ceramic articles. No. 2,241,705. Hobart R. Goodrich to Gladding, McBean & Co.

Manufacture of cement and alkali metal aluminate. No. 2,242,258. Walter Noll to I. G. Farbenindustrie Aktiengesellschaft.

Process preparing virtually vitrified ceramic granules for roofing and the like. No. 2,242,443. John J. Stanko to American Mineral Co.

Chemical Specialty

Putty-like, inadhesive material for use as a modeling compound consisting of salt (NaCl) one cup full; corn starch, one-third cup full and water, one-half cup full. No. 2,241,376. Dorothy Carter.

Process of preparing a sterilizable surgical adhesive tape. No. 2,241,384. Alva W. Bateman and Raymond E. Thomas to E. I. duPont de Nemours & Co.

Abrasive grinding disc consisting of parts adhesively attached by means of polychloroprene. No. 2,241,433. Avery W. Walker to The Carborundum Co.

A process preserving peeled potatoes. No. 2,241,436. Joseph L. Williams.

Method of lubricating bearings of small delicate machinery, without corrosion of bearing metals over periods of time, comprising applying to such bearings a lubricant consisting essentially of tricresyl phosphate. No. 2,241,531. Peter J. Wiezevich to Standard Oil Company.

Method of making a precast 'artificial stone product that comprises mixing at least one of the materials defined as siliceous and argillaceous with quicklime and a compound of an oxy-acid of sulfur, adding water to hydrate the quicklime shaping to the required form, and applying steam under pressure to harden. No. 2,241,604. Norman V. Knibbs and Alfred Pehrson to the Continental Investment Syndicate Ltd.

A paper-adhesive consisting of partially-dextrinized starch dispersed in a solution of a volatile acid and a fluidifying agent consisting of a water-soluble organic compound of such a nature and under such conditions that the total reducing sugar content of said adhesive is limited to a maximum percentage by weight thereof of about 2%, said fluidifying agent consisting of a urea. No. 2,241,700. Paul B. Davidson and Julius R. Adams to Old Colony Envelope Co., Inc.

An aqueous acid cleansing composition for cementitious articles. No. 2,241,790. Ernest W. Rembert to Johns-Manville Corp.

A composition for stopping leaks in engine radiators comprising finely divided fibrous material, resinous material, tannic material to aid suspension of said fibrous material and material to afford chromate ion. No. 2,241,963. Helman Rosenthal to Robert B. Giles.

Glass washing solution comprising the following ingredients in substantially the indicated proportions by weight: caustic soda 2½ to 6%; water-soluble alkaline aluminate ¼ to 1%; water 93 to 97%. No. 2,241,984. William C. Cooper to George J. Meyer Mfg. Co.

Fluorescent screen material and method of making. No. 2,242,061. Bennett S. Ellefson to Hygrade Sylvania Corp.

Cleaning and polishing composition. No. 2,242,261. Jacob Ratner.

Heat-resisting stencil film comprising a thin, tough, flexible transparent cellophane base, and a coating including mineral black 5%, a non-drying oil 12% a vegetable wax 49% and aluminum powder 34% all by weight. No. 2,242,313. John S. Murran to L. C. Smith & Corona Typewriters, Inc.

Process for making a sulfur preparation for use in protecting plants against attacks of living organisms. No. 2,242,384. Frederik L. Begtrup.

Non-aqueous composition for treating coal in the form of free-flowing separate particles or fragments to render it clean and dustless said composition comprising a petroleum oil having a universal viscosity at 100° F. not substantially less than 100 and rosin in solution therein in the ratio of one part of rosin to nine parts of petroleum oil to one part of rosin to one part of petroleum oil by weight, the said solution being non-hardening and non-evaporable under atmospheric conditions. No. 2,242,398. Werner E. Kleinicke to The Johnson-March Corp.

Process of treating plants to expedite bud formation consisting in applying to the growing plants in the field an unsaturated hydrocarbon gas in solution in an oil emulsion of water, oil and colloidal earth. Also treatment of pineapple plants to expedite the development of buds and the formation of fruit thereon which comprises applying a liquid carrying medium bentonite and an unsaturated hydrocarbon selected from the group consisting of acetylene and ethylene. No. 2,242,429. Maxwell O. Johnson to California Packing Corp.

Process and composition for carroting furs. No. 2,242,668. Jacob Dolid.

Process for improving the whipping qualities of gelatin. No. 2,242,883. Donald P. Grettie to Industrial Patents Corp.

In an insecticide, in combination an insecticidal rotenone product, a petroleum oil and a phenol-aldehyde condensation product, the phenolic nucleus of which has a long hydrocarbon chain characteristic of the phenols of cashew nut shell liquid, which said condensation product is common solvent for said rotenone product and said petroleum oil. No. 2,242,911. Mortimer T. Harvey to The Harvel Corp.

An antifreeze composition containing as the freezing-point depressant calcium chloride and as an agent inhibiting the corrosive action of the calcium chloride casein. Also an antifreeze composition containing for each gallon of water, approximately 5 pounds of calcium chloride, 1 pound of sugar and 1-3 ounces of casein. No. 2,242,959. Cecil Robinson to Patrick J. O'Connor.

Detergent composition and manufacture thereof. No. 2,243,054. James G. Vail to Philadelphia Quartz Company.

An insecticidal composition containing pyrethrum and ortho-cyclohexyl phenol. No. 2,243,207. Edward Harvill to Boyce Thompson Institute for Plant Research, Inc.

Horticultural emulsion spray compound. No. 2,243,254. Frank F. Lindstaedt.

Method of making a filter medium which comprises impregnating a fibrous material with an alkaline silicate and then treating the filter medium thus impregnated with a chemical having a metallic base. No. 2,243,296. Ernest J. Sweetland.

Process of controlling infestations of red spiders on plants which comprises applying to the infested plants a spray containing benzyl sulfide. No. 2,243,477. William F. Hester to Rohm & Haas Co.

Roof covering and the process of compounding same. No. 2,243,494. Charlie A. Bartholomew to Woodworth & Turk.

As new composition of matter a mixture cement and a water-soluble hydroxyethylated organic compound containing at least 8 carbon atoms and being free from sulfo groups. No. 2,243,501. Karl Daimler and Heinz Thron to Walther H. Duisberg.

Method of making a sparkling sakelike beverage. No. 2,243,513. Katsuichiro Takakishi.

Process for the manufacture of baked goods. No. 2,243,860. Jacob Freilich & Charles N. Frey to Standard Brands, Inc.

Egg composition. No. 2,243,867. Morris Katzman to The Emulsol Corp.

A non-shortening-containing cake of the angel food type containing flour, beatable protein, sugar, moisture, and a proportion of a reaction product of metaphosphoric acid with an alcohol containing at least four carbon atoms. No. 2,243,868. Morris Katzman to The Emulsol Corp.

Roofing comprising sheet copper presenting an extensive external roofing surface, the copper being alloyed with approximately 0.05% to 0.8% antimony, the balance of the alloy in respect to the antimony being essentially copper. No. 2,244,093. Richard A. Wilkins to Revere Copper and Brass Inc.

A non-offsetting printing ink. No. 2,244,103. Donald R. Erickson and Paul J. Thoma to Michigan Research Laboratories, Inc.

A liquid dielectric composition of matter consisting essentially of a major proportion of unmodified aliphatic phosphate and a minor proportion of unmodified aromatic phosphate having a resistivity within the limits of about $1X10^6$ to $1X10^8$ ohms per centimeter cube. No. 2,244,387. Frank M. Clark to General Electric Co.

An insecticide preparation containing as an active ingredient a product obtainable by the reaction of an aliphatic ketone and ammonium thiocyanate. No. 2,244,547. William P. ter Horst to U. S. Rubber Co.

Fluorescent material. No. 2,244,558. Erich Krautz to General Electric Co.

Process for increasing the melting point of chocolate comprising hydrogenating chocolate at a temperature of from about 100° C. to about 150° C. No. 2,244,569. Frederic H. Penn.

Coal Tar Chemicals

Process improving toxicity of wood preservative from tar oil. No. 2,241,400. Jacquelin E. Harvey, Jr. to Southern Wood Preserving Co.

Production of aliphatic branched chain hydrocarbons of the diolefin series. No. 2,241,777. Wilhelm Fredrichsen to General Aniline & Film Corp.

Preparation of modified olefin-sulfur dioxide polysulfones. No. 2,241,900. Merlin M. Brubaker and Jesse Harmon to E. I. du Pont de Nemours & Co.

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Process of preparing amino acids. No. 2,241,927. Melville Sahyun.

Method of reducing 2-amino-4-chloropyrimidine to 2-aminopyrimidine which comprises treating the material in aqueous dispersion with finely divided metallic zinc under alkaline conditions. No. 2,224,079. Erwin Kuh and Martin Everett Hultquist to American Cyanamid Co.

Process for preparing p-isopropylalphamethyl-hydrocinnamic aldehyde. No. 2,242,322. Louia Poizat to Societe des Usines Chemiques Rhone Polenc.

Preparation of napththoquinine carbazoles. No. 2,242,449. Willy Burneleit to General Aniline & Film Corp.

A phthalocyanine of the group consisting of copper and nickel phthalocyanines of the benzene series, each of the benzene nuclei of which is substituted in its 4 and 5 positions by a carboxylic acid group and a phenyl group. No. 2,242,469. Hans Hoyer, Rudolf Schroter and Heinrich Rinke to General Aniline & Film Corp.

Nitrogenous condensation products from a member of the group consisting of 1.2-alkylene imines and polymerization products of 1.2-alkylene imines and saturated aliphatic isothiocyanic acid esters. No. 2,242,490. Heinrich Ulrich and Karlhugo Kuespert to General Aniline & Film Corp.

Process which comprises reacting a compound of the following general formula, $Hlg.CH_2CH_2O.CH_2CH_2Hlg$, with an arylaceto-nitrile in the presence of an agent capable of splitting off hydrogen halide. No. 2,242,575. Otto Eisleb to Winthrop Chemical Co.

Dibenzo-acridines. No. 2,242,585. Erich Lehmann to General Aniline & Chemical Corp.

Process for the separation of anthacene and carbazole. No. 2,242,842. Viktor M. Weinmayr to E. I. duPont de Nemours & Co.

Sulfonic acid amides and a process of preparing them. No. 2,243,437. Ludwig Orthner, Gerhard Balle and Karl Horst to General Aniline & Film Corp.

Hydroxy benzoic acid esters. No. 2,243,694. Walter G. Christiansen and Sidney E. Harris to E. R. Squibb & Sons.

Tertiary carbinols of the cyclopentanopolyhydrophenanthrene series and a method of producing the same. No. 2,243,887. Arthur Serini and Lothar Strassberger to Schering Corp.

Process for producing O,O'-dihydroxydiphenyl. No. 2,244,244. Wilhelm Deseke to the firm Ruetgerswerke-Aktiengesellschaft.

The [benzene-arsenic acid (4)]-<1-azo-2>-[naphthol-(1)disulfonic acid (4, 8)]. No. 2,244,293. Ernst A. H. Friedheim.

Coatings

Process protecting iron containers for liquid fuels by coating with hydraulic cement, allowing to set and then subjecting to treatment with soluble salt of fluosilicic which forms insoluble fluorides with the coating composition. No. 2,241,493. Heinrich van Thiel to Walter H. Duisberg.

Method removing baked organic coatings consists in immersing the work in an emulsion of water and a composition comprising, in volumetric proportion 10% to 80% of a material selected from the group consisting of cresylic acid, phenol, orthocresol, metacresol and paracresol, 5% to 10% of potassium oleate, and 5% to 10% of water, the amount of water added to the composition being in the proportion of one to forty parts of water to two parts of the composition, the immersion being continued until the coating is loosened, and then removing the work from the bath and rinsing it in water. No. 2,242,106. Jacob F. Buckman.

Chalk resistant oleaginous surface coating composition containing a titanium dioxide pigment and between about 0.2% and about 5.0% chromium naphthenate based upon the weight of the said pigment. No. 2,242,320. George F. New to Titan Co., Inc.

Oil composition suitable for coatings hardening by polymerization under the action of heat without substantial oxidation. No. 2,242,489. Victor H. Turkington to Union Carbide & Carbon Corp.

Improved lignin coating composition useful as a varnish and lacquer. No. 2,242,601. Frederick J. Wallace to Roberson Process Co.

A film-forming protective composition adapted for use as an anti-corrosion material on surfaces of corrodible metals. No. 2,242,837. James E. Shields to Alox Corp.

Coating composition particularly adapted for the coating of rubber surfaces. No. 2,243,185. Kenneth D. Bacon and Toivo A. Kauppi to The Dow Chemical Co.

Process for the production of a conductive coating on an object having a nonconductive surface. No. 2,243,429. Rudolf Laux to Langbein-Pfanhauser-Werke Aktiengesellschaft.

Dyes, Stains, Etc.

40-nitro-2-chlor-6-brom-benzene-azo-N-di- (B-hydroxy-ethyl) -aniline, for coloration of textile and other materials. No. 2,241,449. George H. Ellis and Henry C. Olpin to Celanese Corp. of America.

Monoazo dyestuffs. No. 2,241,774. Richard Fleischauer, Carl T. Schultis and Ernst Korten to General Aniline & Film Corp.

Acid azo dyestuffs which dye animal fibers yellow shades of good fastness. No. 2,241,795. Carl Taube and Heinrich Rinke to General Aniline & Film Corp.

Azo dyestuffs. No. 2,241,796. Carl Taube, Heinrich Rinke and Erich Fischer to General Aniline & Film Corp.

Process for the manufacture of phthalocyanine coloring matters which comprises heating an o-arylene dicyanide and a cupriferous reagent in an inert, non-basic medium, until a solid, bluish to greenish colored compound has been formed. No. 2,242,301. Isidor M. Heilbron, Francis Irving, and Reginald P. Linstead to Imperial Chemical Industries Ltd.

Vat dyestuffs of the anthraquinine series and process of making the same. No. 2,242,411. Wilhelm Bauer to General Aniline & Film Corp.

Vat dyestuffs of the anthraquinineacridone-carbazole series. No. 2,242,446. Wilhelm Bauer to General Aniline & Film Corp.

New polyazo dyestuffs. No. 2,242,456. Detlef Delfs and Eberhard Stein to General Aniline & Film Corp.

Water-soluble basic dyestuffs. No. 2,242,474. Gerd Kochendoerfer and Walther Retter to General Aniline & Film Corp.

Chromable dyestuffs of the triarylmethane series and a process of preparing them. No. 2,242,572. Wilhelm Eckert and Karl Schilling to General Aniline & Film Corp.

Organic dyestuffs and process of producing same. No. 2,242,760. Conrad Schoeller, Gustav Schwen and Georg Kraemer to General Aniline & Film Corp.

Manufacture of disazo dyestuffs. No. 2,243,014. Max Muller and Roger Ratti to Durand & Huguenin A. G.

Process of preparing 8-alkyl unsymmetrical carbocyanine dyes. No. 2,243,081. Leslie G. S. Brooker and Frank L. White to Eastman Kodak Co.

Process of producing fast dyeings on cellulose esters and ethers and the dyes fiber obtained thereby. No. 2,243,213. Geor gKranzlein, Carl J. Muller and Werner Kirst to General Aniline & Film Corp.

Azo dyestuffs and process of making same. No. 2,243,617. Gerald Bonhote and Carl Apotheker to Society of Chemical Industry in Basle.

Disazo dyes for cellulose esters and ethers. No. 2,244,339. Donovan E. Kvalnes to E. I. du Pont de Nemours & Co.

Disazo dyes. No. 2,244,340. Swanie S. Rossander and Donovan E. Kvalnes to E. I. du Pont de Nemours & Co.

Vat dyestuffs of the anthraquinone series. No. 2,244,655. Hans Schlichenmaier and Ludwig W. Berlin and Erich Berthold to General Aniline & Film Corp.

Equipment and Apparatus

Machine for disintegrating solid and semisolid materials. No. 2,241,491. William P. Treloar to The Phoenix Supply Co.

Measuring means for determining the comparison of a controlled furnace atmosphere formed by the gaseous resultant of the more or less complete combustion of air and a fuel gas. No. 2,241,555. Anker E. Krogh and Joseph P. Vollrath to The Brown Instrument Co.

In means for the removal of vapor from gases, fragments of mineral wool carrying a vapor absorbing compound, said fragments being enmeshed in a mass of uncompacted filamentary wool, the filamentary wool having non-absorbent characteristics, being of a material which is substantially inert with respect to chemical reaction with the compound. No. 2,241,600. Clyde L. Hunsicker.

In a gasoline tank of aluminum-containing construction, water in which a chromate is dissolved and gasoline which has mixed therewith a compound of a metal which is electropositive to aluminum. No. 2,241,638. Paul D. Ffield to Wingfoot Corp.

Gas washing apparatus. No. 2,241,674. Albert Mohr, Jr., John P. Grilli.

Apparatus for making proportional liquid additions to measured quantities of liquid. No. 2,241,732. Frederick E. Olson and Peter G. McAra.

Apparatus for classifying and separating particles of materials of different specific gravities. No. 2,241,842. Jean A. Brusset.

Receptacle for liquids. No. 2,241,846. William R. Cuthbert to W. A. Sheaffer Pen Co.

Water purifying and deaerating apparatus. No. 2,241,873. Joseph D. Yoder to The Permutit Co.

Regenerative water softener for automatic washing machines. No. 2,241,887. Eric Pick to The Permutit Co.

Apparatus for and method of obtaining or separating volatile substances from solutions containing the same. No. 2,242,267. Max Seidel.

Method of scrubbing blast furnace gas. No. 2,242,294. Gordon Fox, Alfred J. Ebner and Owen R. Rice to Freyn Engineering Co.

Contrivance for producing water gas in horizontal coke ovens. No. 2,242,306. Heinrich Koppers to Koppers Company.

Gas purification process. No. 2,242,323. Alfred R. Powell to Koppers Co.

An apparatus for conducting catalytic gas reactions. No. 2,242,390. Morris T. Carpenter to Standard Oil Company.

Apparatus for depilating food carcasses. No. 2,242,402. Walton L. McCaslin to Armour & Company.

Apparatus for mixing oil with steam. No. 2,242,424. Andrew J. Fisher to The C. M. Kemp Mfg. Co.

Acetylene generator. No. 2,242,571. Maurice P. De Motte and Ralph C. Pierson to The Prest-O-Lite Co., Inc.

Mechanism for feeding explosive pellets to detonator cups. No. 2,242,657. Harry W. Morgan to The Canister Co.

Inductive heat treating apparatus. No. 2,242,838. Howard E. Somes.

An apparatus for continuously forming a detergent product. No. 2,242,979. Fred Weaver Muncie to Colgate-Palmolive-Peet Co.

Apparatus for spinning rayon. No. 2,242,999. Alfred S. Brown to Skenandoa Rayon Corp.

Apparatus for producing coke and gas. No. 2,243,052. Glenn H. Niles and Alfred Johnson to Combustion Utilities Corp.

Reissue. Thickening, stirring or agitating apparatus. No. 21,811. Henry Kepper to The Dorr Co.

Degreasing and cleaning apparatus. No. 2,243,093. Robert F. Flahive to Leo Balles.

Luminescent screen comprising a mixture of silver activated zinc sulfide and manganese activated zinc borate. No. 2,243,097. Stanley T. Henderson to Electric & Musical Industries Ltd.

In method of refrigeration which comprises condensing and evaporating a refrigerant the step which comprises condensing the refrigerant and evaporating it in the presence of a mineral oil containing disalicylal ethylene diamine. No. 2,243,104. Frederick L. Koethen to E. I. du Pont de Nemours & Co.

Method of and apparatus for reducing ores and effecting other chemical reactions. No. 2,243,110. Julius D. Madaras to Madaras Corp.

Manure dehydrator. No. 2,243,192. James G. Clark.

Pressure vessel for hydrogenating hydrocarbons. No. 2,243,240. Frederick K. Zerbe to A. O. Smith Corp.

Apparatus for mixing and granulating substantially plastic materials. No. 2,243,384. Hans Lehrecke to Aktiebolaget Kemiska Patenter.

Apparatus for unlocking ore bodies to extract sulfur and iron therefrom. No. 2,243,406. Harry Comer Wolf.

Fluid heat exchange apparatus. No. 2,243,430. Charles E. Lucke to The Babcock & Wilcox Company.

Apparatus for the sterilization of liquid. No. 2,243,761. Wincenty Matska.

Plastic casting machine. No. 2,243,968. Nathan Lester to Lester Engineering Co.

Apparatus for treating textiles. No. 2,243,997. Emil J. Berger and Howard W. Matthews to Dexdale Hosiery Mills.

A sheet metal evaporator. No. 2,244,010. Bernard C. Johnson and Edgard C. Franco-Ferreira to Houdaille-Hershey Corp.

Process for manufacturing dry cells. No. 2,244,016. Paul A. Marsal to National Carbon Co.

Purification of oil in a centrifugal separator. No. 2,244,034. Pieter van Riel to N. V. Machinefabriek "Reineveld," Delft.

Bulk plant pumping system and control. No. 2,244,106. Albert J. Granberg and Thomas A. McCoy to Granberg Equipment Inc.

Gas mixing apparatus. No. 2,244,111. Garnet W. McKee.

In a furnace for generating steam, an enclosure constituting a combustion chamber, heat absorbing walls disposed within said chamber in manner to divide it into compartments, and steam superheating tubes carried by and constituting part of said heat absorbing dividing walls. No. 2,244,144. Montrose K. Drewry.

Apparatus and process for fluidifying and mixing by means of compressed air. No. 2,244,195. Alexander Hasselbach to G. Polysius Aktiengesellschaft.

Method and apparatus for regulating the temperature of fluids. No. 2,244,327. Alfred H. Brundage.

Method for dispensing methyl bromide. No. 2,244,341. Neil A. Maclean to The Dow Chemical Co.

Acetylene generator. No. 2,244,419. James C. Dickens to W. H. Taylor.

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Catalytic converter. No. 2,244,599. Daniel B. Banks to Sun Oil Co.
Portable apparatus for testing products of combustion for carbon dioxide. No. 2,244,610. Alfred B. Costello.

Fine Chemicals

Process of making a metal lignin sulfonate. No. 2,241,627. Howard B. Birt, Wm. C. Pritchard and Robert A. Daily to General Motors Corp.
Process for preparing a N-furfurylaminophenol comprising reacting a N-furfurylidene aminophenol with alkali and a metal capable of liberating hydrogen from the alkali. No. 2,241,760. Frederic R. Bean to Eastman Kodak Co.
Process for the manufacture of aryl diamines having at least one sulfonic group in their molecule. No. 2,241,769. Joseph B. Dickey and James G. McNally to Eastman Kodak Co.
Process for the manufacture of aryl mercury compounds. No. 2,241,829. Georges J. Six and Joseph R. Booer to F. W. Berk & Co., Inc.
Mixture of higher molecular alcohols of the general formula $C_nH_{2n+1}OH$ corresponding to fatty acid radicals of cocoanut oil in number of carbon atoms. No. 2,242,017. Wilhelm Normann to American Hyalsol Corp.
Synthesis of 2-amino thiazoles. No. 2,242,237. Walter G. Christiansen to E. R. Squibb & Sons.
Process for purification of an aliphatic dinitrile which comprises washing said aliphatic dinitrile with a solution containing a bisulfite. No. 2,242,309. Wilbur A. Lazier and George W. Rigby to E. I. du Pont de Nemours & Co.
An organo-metallic compound of the formula $(MgI_2(CH_3)_2[C_2H_5)_2O]_2)Ca$. No. 2,242,516. Clement Duval to Societe d'Electrometallurgie ed des Acrieries Electiques d'Ugine.
Aryl arsine oxides. No. 2,242,581. Walter Herrmann and Friedrich Hampe to Winthrop Chemical Co., Inc.
Process for the manufacture of hydantoins. No. 2,242,775. William G. Bywater to Parke, Davis & Co.
A method for preparing nitrogenous derivatives of polysaccharides. No. 2,243,630. Alva L. Houk and Louis H. Bock to Rohm & Haas.
A method of producing or increasing vitamin D in ergosterol. No. 2,243,632. Menfred L. Johnson to Vitamin Technologists, Inc.
Method of making protein products. No. 2,243,871. James N. Lawrence and Russell H. Hieronymus to The Drackett Co.
Process of separating a monobasic acid salt of one of the group consisting of ammonia and the guanidines and biguanides from a mixture containing essentially the same and a polybasic inorganic oxy acid salt of the guanidines and biguanides. No. 2,244,253. William H. Hill to American Cyanamid Co.
As a new product a homogeneous liquid mixture comprising a difficultly soluble horme, 3, 4-dimethoxy-benzyl alcohol and water. No. 2,244,277. Wilhelm Wenner to Hoffmann-LaRoche Inc.
Process for the production of an alkyl bromide. No. 2,244,324. Harry Bender to The Dow Chemical Co.
Process for preparing biliary acids having a ketonic function. No. 2,244,328. Raymond Charonnat and Alain Horeau to Chimie et Atomistique.
Dimethyl alpha, alpha'-dimethyldihydromuconate. No. 2,244,487. John W. C. Crawford to Imperial Chemical Industries, Ltd.
Process of preparing dimethyl alpha, alpha' dimethyl dihydromuconate. No. 2,244,645. Ralph A. Jacobson to E. I. du Pont de Nemours & Co.

Industrial Chemicals

Process of preparing lauric alcohol comprising treating the ethyl ester of lauric acid with hydrogen in the presence of metallic copper at a pressure of about 100-200 atmospheres and at a temperature between 300° and 400° C. No. 2,241,416. Wilhelm Normann to American Hyalsol Corp.
Process for production of alcohols of high molecular weight comprises passing a glyceride of a carboxylic acid having more than 8 carbon atoms in the acid radical with hydrogen, while heating to a temperature of the range from 200° to 400° C. over a copper containing hydrogenation catalyst. No. 2,241,417. Wilhelm Normann to American Hyalsol Corp.
Ethers and their sulfonated derivatives. No. 2,241,421. Donald Price and Bernard A. Dombrow to National Oil Products Co.
Process for the catalytic oxidation of ketones. No. 2,241,487. Ober C. Slotterbeck to Standard Oil Development Co.
Process for preparing high molecular weight polymerization products comprising bringing an aralkyl halide into contact with a solution of a Friedel-Crafts catalyst in an alkyl chloride at a temperature between 45° C. and zero° C. No. 2,241,488. William J. Sparks and Donald C. Field to Standard Oil Development Co.
Improved wax composition comprising a petroleum wax and a small amount of tertiary butyl ether of ortho tertiary butyl para cresol. No. 2,241,497. Jones I. Wasson and James Prophet, Jr. to Standard Oil Development Co.
Method for the production of nitrates and hydrochloric acid from chlorides capable of metathetical reaction with nitric acid. No. 2,241,613. Harry Pauling.
Process of and composition for clarifying water. No. 2,241,641. Rowland R. Magill to Joseph F. Gunther and Gerard K. Gunther.
Product comprising a chemical combination of a furan compound containing the furan ring and no other ring with material of the group consisting of the RO, R_2O_3, and RO_2 chemical groups in which R may be any metal. No. 2,241,676. Otto C. Rohde and John P. Kelly to Champion Spark Plug Co.
Method treating hydrocarbons. No. 2,241,708. Edwin T. Layng to Process Management Co., Inc.
In process for the recovery of sulfur dioxide from gaseous mixtures by the use of sulfur dioxide absorbing liquids which consist of aqueous solutions of salts, the method of maintaining the concentration of thionates which accumulate in the absorbent below a value equivalent to 0.15 gm. of oxidisable sulfur per 100 milliliters of absorbent. No. 2,241,709. Norman Levy to Imperial Chemical Industries Ltd.
Process for the concentration of solutions emulsions and the like by freezing out water and separating the resulting ice from concentrate by pressing which comprises pressing a mixture of ice and concentrate while supplying sufficient heat to the mixture to cause the ice to be warmed up to the melting point and a part of the ice to be melted in the pressing operation. No. 2,241,726. Georg A. Krause to Gesellschaft fur Linde's Eismachinen A. G.
Method of producing fertilizers and soil improving agents from organic waste materials. No. 2,241,734. Kai Peterson.
Process of producing alkaline-earth molybdates in lumps. No. 2,241,742. Gustav Schuphaus.
Method stabilizing a polymerizable vinyl compound against polymerization during storage and distillation by treating the same with phenylacetylene and thereafter removing the phenylactylene to recover the vinyl compound in readily polymerizable form. No. 2,241,770. Robert R. Dreisbach, Sylvia M. Stoesser and Alden W. Hanson to The Dow Chemical Co.
Process producing insoluble silicates. No. 2,241,791. Ernest W. Rembert to Johns-Manville Corp.
Process for production of butadiene which comprises leading tetrahydrofurane in the gas phase at temperatures between about 250° and 450° C. over a phosphate catalyst having an acid reaction. No. 2,241,792. Walter Reppe and Otto Hecht to General Aniline & Film Corp.
Process for preparing hydrated copper chlorides. No. 2,241,800. Fritz Wolff to Sherka Chemical Co.
Method of processing blood. No. 2,241,868. Albert Reimann to Hall Laboratories, Inc.
An inhibitor for crystal formation at low temperatures for use in chlorinated aromatic hydrocarbons consisting of a mixture of isomers of tetrachlorbenzene which includes about 1 to 13% of 1, 2, 4, 5 isomer and a quantity up to 10% of pentachlorbenzene not exceeding the quantity of 1, 2, 4, 5, isomer and equal at least to about one-half of said 1, 2, 4, 5 isomer. No. 2,241,982. Frank M. Clark to General Electric Co.
Process which comprises causing a metal condensing agent to act upon 1, 2 dichlorobutene-3 at a temperature of at most 50° C. No. 2,242,084. Otto Nicodemus and Walter Schmidt to I. G. Farbenindustrie Aktiengesellschaft.
Surface-active products and a process of preparing them. No. 2,242,086. Karl Platz, Fritz Bucking, Karl Smeykal, Friedrich Asinger, Kreis Merseburg to I. G. Farbenindustrie Aktiengesellschaft.
Process of separating soap stock. No. 2,242,175. Benjamin Clayton and Benjamin Thurman to Refining Inc.
Process of producing soap and recovering glycerine. No. 2,242,187. Benjamin H. Thurman to Refining, Inc.
Process of partially refining vegetable oils containing gums. No. 2,242,188. Benjamin H. Thurman, Refining, Inc.
Quaternary compounds of the pyridine series and process for the production of same. No. 2,242,211. Erich Haack to Chemische Fabrik Von Heyden Aktiengesellschaft.
Process of producing a surface-active wetting agent which comprises heating a halogenated paraffin wax with a tertiary amine below their boiling points under substantially anhydrous conditions. No. 2,242,223. Rudolph S. Bley to North American Rayon Corp.
Process of producing a surface-active wetting agent which comprises heating a halogenated non-gaseous, aliphatic petroleum hydrocarbon with a tertiary amine below their boiling points under substantially anhydrous conditions. No. 2,242,224. Rudolph S. Boey to North American Rayon Corp.
Method of making precipitated calcium carbonate preparations in finely divided form. No. 2,242,228. Donald B. Bradner to The Champion Paper & Fibre Company.
Process for producing conjugation in unconjugated fatty polyene compounds which comprises treating the unconjugated polyene compound in the substantial absence of water at an elevated temperature with an excess of a basic reagent. No. 2,242,230. George O. Burr to Regents of the University of Minnesota.
In process of preparing cyclopropane in a reactor of metal different from the reduction agent, the step of reacting a trimethylene dihalide with a metal reduction agent in and about 90-95% by volume aqueous lower aliphatic alcohol. No. 2,242,235. Frank C. Chase to E. R. Squibb & Sons.
Process which comprises condensing together in the presence of a condensing agent capable of eliminating hydrogen halide (1) a poly-halogenated terpene and (2) a phenol in the proportion of substantially more than one molar weight of the phenol to each molar weight of the polyhalogenated terpene. No. 2,242,250. Herbert Honel and Alois Zinke to Reichhold Chemicals, Inc.
Method of chlorinating chromium bearing material containing at least about 10 per cent chromium and containing magnesium which comprises chlorinating said material at a temperature sufficiently high to cause volatilization of magnesium chloride. No. 2,242,257. Irving E. Muskat to Pittsburgh Plate Glass Co.
A lubricating composition comprising a halogenated aromatic thiophosphate. No. 2,242,260. Carl F. Prutton to The Lubri-Zol Development Corp.
Method of preparation of a soap. No. 2,242,289. William W. DeLaney to Hercules Powder Company.
In a process involving the solution of a dry solid mixture of calcium hypochlorite and an alkali metal metaphosphate present in an amount sufficient to render the mixture soluble in an aqueous solution of the class consisting of soap solutions, solutions of alkaline detergents and hard waters in an aqueous medium. No. 2,242,315. James D. MacMahon to The Mathieson Alkali Works, Inc.
Method of producing alkyl phenols. No. 2,242,325. Roland R. Read to Sharp & Dohme, Inc.
Purification of synthetic methanol. No. 2,242,463. Johann Giesen and Paul Herrmann to William E. Currie.
Process for vaporization of adipic acid. No. 2,242,466. Crawford H. Greenewalt and Hood Worthington to E. I. du Pont de Nemours & Co.
Process of preparing hydroxylamine hydrochloride. No. 2,242,477. Philipp Osswald and Walter Geisler to Walther H. Duisberg.
Process for the production of beryllium compounds. No. 2,242,492 and 2,242,493. Helmut von Zeppelin to Walther H. Duisberg.
Process of manufacturing sodium sulfate and ammonium chloride. No. 2,242,507. Walter Burg to Robert L. Burg.
Method of producing resin soap. No. 2,242,529. Arthur Langmeier to Hercules Powder Company.
Process for production of quaternary ammonium compounds useful for water repellence. No. 2,242,565. Edgar Wolf to Heberlein Patent Corp.
Electrolytic production of lead chromates. No. 2,242,634. Elbert Franklin Weaver to International Smelting & Refining Co.
Method of treating clay containing absorbed oil to remove oil therefrom and adapt the clay for various uses. No. 2,242,639. Paul D. Barton to Sun Oil Co.
Process of desentizing the non-printing portions of the surface of a metal lithographic plate, which consists of treating the image bearing surface of the plate with an aqueous solution of gum arabic and chrome alum. No. 2,242,754. William N. Misuraca.
Reduction of difficultly reducible oxides. No. 2,242,759. Helmut Schlect and Michael Jahrstorfer to Walther H. Duisberg.
Process of treating copperas to obtain gases suitable for use in the production of sulfuric acid, comprising partially dehydrating copperas and completely calcining the same substantially entirely by subjecting it directly to the radiant heat and gases derived from the flash combustion of pyrites fines. No. 2,242,763. Benjamin A. Smith to The C. O. Bartlett & Snow Co.
Composition comprising a mixture of magnesium chloride, water and a caustic non-sintered magnesia in approximately molar proportions of

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8 moles of magnesium oxide, 1 mole of magnesium chloride and 15 moles of water. No. 2,242,785. Karl Kammuller and Robert Scheibe.

That method of treating coal which comprises treating coal in mildly oxidized condition in which the coal substance is converted, at least in part to hydroxy-carboxylic acids, with an organic solvent containing heterocyclic oxygen and thereby dissolving oxidized coal substance and separating the thus-formed coal solution from undissolved mineral matter. No. 2,242,822. Walter M. Fuchs to The Pennsylvania Research Corp.

Process of producing aromatic hydrocarbons from olefins. No. 2,242,836. Alexander S. Ranage to Coals & Chemicals, Ltd.

Process of reacting an olefin mixture containing propylene and butylene with isobutane in the presence of concentrated sulfuric acid. No. 2,242,845. Arthur L. Blount to Union Oil Co. of Calif.

Catalyst and process of preparing same. No. 2,242,849. Jan L. de Roos.

Manufacture of anhydrous silicates in pumiceous form. No. 2,243,027. Chester L. Baker to Philadelphia Quartz Co.

Process of treating manganiferous silicate ores to obtain the manganese in concentrated form. No. 2,243,044. George C. Westby to Soluble Silicates Process Co., Inc.

Process for manufacturing oxygen compounds of terpene hydrocarbons. No. 2,243,053. Alexander S. Ramage.

Manufacture of monobasic aluminum sulfite. No. 2,243,060. Wilhelm Fulda, Erich Wiedbrauck and Karl Buche to Th. Goldschmidt Corp.

Process for extracting the essential principles of hops. No. 2,243,143. Lyndon D. Wood to National Hops Laboratories, Inc.

New chemical product comprising a reaction product of a cyclohexylamine containing at least one hydrogen atom on the amino nitrogen atom with an aldehyde combined in the ratio of two molecular proportions of amine and one molecular proportion of aldehyde further reacted with carbon bisulfide. No. 2,243,172. Robert L. Sibley to Monsanto Chemical Co.

Production of olefins and diolefins. No. 2,243,191. Adolf Cantzler and Hans Krekeler to Jasco Inc.

Process for the production of N-substituted (arylalkyl) amines. No. 2,243,295. Alfred G. Susie and Henry B. Haas to Purdue Research Foundation.

Substituted pyrazolones. No. 2,243,324. James H. Williams to American Cyanamid Co.

A sodium salt of a primary aliphatic monosulfonic acid. No. 2,243,331. Martin de Simo and John J. O'Connor to Shell Development Co.

A sodium salt of a secondary aliphatic monosulfonic acid. No. 2,243,332. Martin de Simo, John O'Connor and George S. Parsons to Shell Development Co.

Process for manufacturing sugar. No. 2,243,381. Volkmar Klopfer.

Method improving the mechanical strength of formed catalyst units which comprises impregnating the same with a solution of a silicic acid ester and thereafter decomposing the ester. No. 2,243,404. Alexis Voorhies, Jr. to Standard Oil Company.

Method of improving adhesivity of a bituminous composition which comprises adding approximately 1 to 2½% of an asphalt soluble lead soap to an asphalt and maintaining at a temperature of 210° F. to 350° F. for at least 5 days. No. 2,243,409. Emile L. Baldeschwieler to Standard Oil Company.

Process which comprises polymerizing isobutylene in the presence of carbon tetrachloride with boron fluoride as catalyst at a temperature below —10° C. No. 2,243,470. Arnold J. Morway and Floyd L. Miller to Standard Oil Development Co.

Process of preparing an aliphatic nitrate. No. 2,243,471. John F. Olin to The Sharples Chemicals Corp.

Process for the preparation of monohalogenated ketones. No. 2,243,484. Glen H. Morey to Commercial Solvents Corp.

Asphalt emulsion and method of preparing same. No. 2,243,519. Edwin J. Barth to Sinclair Refining Co.

A parasiticidal preparation containing as an active constituent a composite oily to resinous distillable product resulting from condensing an aromatic compound selected from aromatic hydrocarbons and nuclear-halogen substitution products thereof with an alkylene halide. No. 2,243,543. William P. ter Horst to United States Rubber Company.

Zinc soap of cocoanut oil fatty acids combined with an amine. Also as an improved moth-proofing agent, a zinc soap of cocoanut oil combined with an amine. No. 2,243,544. William P. ter Horst to United States Rubber Company.

An oxidizing composition which is a mixture of dry materials comprising sodium perborate as the principal ingredient, a wetting agent sodium pyrophosphate as a stabilizing agent and normal sodium sulfate as an oxygenevolution-accelerating agent. No. 2,243,683. Joseph L. Richmond to E. I. du Pont de Nemours & Co.

Process for producing butanol-(1)-one-(3). No. 2,243,701. Paul Halbig and Alfred Treibs to Consortium Fur Elektrochemische Industrie G. m. b. H.

Method of treating sewage and industrial waste comprising introethers. No. 2,243,802. Torsten Hasselstrom and Burt L. Hampton to G. & A. Laboratories.

Process for the continuous production of hydrogen peroxide from potassium persulfate. No. 2,243,810. Modeste Salleras to Buffalo Electro-Chemical Co., Inc.

Method of treating sewage and industrial waste comprising introducing thereto a chemical coagulant in predetermined proportion and modifying such proportionality through an established time cycle. No. 2,243,826. Aage F. Nielsen and William L. Paulison, Jr. to Bailey Meter Co.

Synthetical production of paraffin. No. 2,243,897. Franz Fischer and Helmut Pichler to Hydrocarbon Synthesis Corp.

Process for the preparation of amino-alcohols. No. 2,243,977. Julius Peyer to Sandoz, Ltd.

Preparation of alkyl esters. Hans G. Vesterdal to Standard Alcohol Co.

An emulsifiable composition having improved emulsifiable and wetting properties comprising an oil and a chlorinated oil-soluble soap of sulfonic acid. No. 2,243,994. Elmer W. Adams and Frederick H. MacLaren to Standard Oil Co.

A water treating product comprising distinct granules of sodium hexa meta phosphate, each granule being composed of a number of irregularly shaped particles of powdered sodium hexa meta phosphate, said granules having a solubility rate in excess of said powdered sodium hexa meta phosphate. No. 2,244,158. Findley E. Hubbard and Campbell R. McCullough to Monsanto Chemical Co.

Manufacture of n, n-dicylohexylparaphenylene diamine. No. 2,244,174. Paul M. Ruedrich and Lesle H. Sharp to Tide Water Associated Oil Co.

Preparation of polyamides. No. 2,244,192. Paul J. Flory to E. I. du Pont de Nemours & Co.

Polymeric material. No. 2,244,208. John B. Miles, Jr. to E. I. du Pont de Nemours & Co.

Method for partially oxidizing methane. No. 2,244,210. Paul Hashan.

Basic titanium phthalate having the formula $C_8H_4O_4.(TiO(OH)_2)_2$. No. 2,244,258. Walter K. Nelson and Arthur O. Ploetz to National Lead Co.

A compound having the formula $R—O—(C_nH_{2n}—O)_m—C_nH_{2n-1}$. No. 2,244,308. Clarence L. Moyle and Gerald H. Coleman to The Dow Chemical Co.

Unsaturated ethers. No. 2,244,309. Clarence L. Moyle and Gerald H. Coleman to The Dow Chemical Co.

Process of producing a colloidal solution of an acidic oxide which comprises passing a solution of an alkali salt thereof through a mass of ion-exchange material which has been treated with an acidic reagent. No. 2,244,325. Paul G. Bird.

Process for preparing siliceous base exchange substances. No. 2,244,383. Richard E. Benson.

Method of making esters of alphamethacrylic acid which comprises reacting the corresponding ester of alpha-hydroxy isobutyric acid with phosphorus pentoxide while admixed with a phosphate ester and separating the ester of alphamethacrylic acid from the reaction mass. No. 2,244,389. Gaetano F. D'Alelio to General Electric Co.

Method of preparing mono-substituted cyanamides and their polymers. No. 2,244,421. Walter P. Ericks to American Cyanamid Co.

Recovery of basic calcium hypochlorite compounds. No. 2,244,477. Heinrich Reitz and Hans Ehlers to Pen-Chlor, Inc.

Preparation of aliphatic-aromatic sulfonates. No. 2,244,512. Robert L. Brandt to Colgate-Palmolive-Peet Co.

Method of making catalysts. No. 2,244,573. George Roberts, Jr. to The M. W. Kellogg Co.

Contact catalytic process for conversion of hydrocarbons. No. 2,244,612. John A. Crowley, Jr. to Socony-Vacuum Oil Co.

In the preparation of methyl bromide by reacting hydrogen bromide with methyl alcohol in the substantial absence of dehydrating agents, the step of carrying the reaction out in the presence of a gaseous reducing agent. No. 2,244,629. John E. Livak and Amos T. Knutson to The Dow Chemical Co.

Leathers and Tanning

Tanning substances and their manufacture. No. 2,242,681. Josef Schafer and Robert Biedermann to J. R. Geigy S. A.

Process of producing artificial leather from vinyl polymerides. No. 2,243,736. Fritz Loblein to Deutsche Celluloid-Fabrik Aktiengesellschaft.

Tanning preparation and method of making the same. No. 2,244,410. Frederick J. Wallace to Robeson Process Co.

Metals, Alloys

Method of making wrought iron by the Aston process. No. 2,241,434. Frederick W. White to A. M. Byers Co.

Process for separating indium from indium-containing materials. No. 2,241,438. Clarence Zischkau and Henry B. Linford to American Smelting and Refining Co.

Manufacture of metal to porcelain seals. No. 2,241,505. Moses J. Cuttler.

Process for the recovery of beryllium from raw materials which contain beryllium compounds together with aluminum, silicon and iron compounds. No. 2,241,514. Gustav Jaeger and Alfred Rudert to Deutsche Gold und Silber Scheideanstalt vormals Roessler.

Method of making gray cast iron which consists in adding to the cast iron when it is in a molten state a copper base alloy. No. 2,241,575. Thomas E. Barlow to Battelle Memorial Institute.

Process of removing copper plate from a copper plated part comprising subjecting said part as an anode to electrolysis in an electrolyte consisting of an aqueous solution of ammonium hydroxide and ammonium nitrate. No. 2,241,585. Wm. E. Day, Jr. to Mack Mfg. Corp.

Process of recovering precious metals by amalgamation from ores containing substantial quantities of slime. No. 2,241,605. Kellogg Krebs and Lee E. Tucker to American Cyanamid Co.

Process for treating lead. No. 2,241,806. Harvey M. Burkey to The American Metal Company, Ltd.

Method of improving the properties of copper which comprises alloying with copper 0.5 to 5% of an element selected from the group consisting of nickel and cobalt and 0.1 to 2% silicon, casting the resulting alloy and then annealing the alloy in the "as cast" condition at a temperature between 400° C. and 600° C. for a period of from several minutes to several hours to improve the hardness and tensile strength. No. 2,241,815. Franz R. Hensel and Earl I. Larsen to P. R. Mallory & Co.

An electric contact member composed of 0.1 to 0.3% nickel and the balance substantially all silver. No. 2,241,816. Franz R. Hensel and Kenneth L. Emmert to P. R. Mallory & Co., Inc.

A ductile manganese-base alloy containing from about 0.1% to about 5% of a member selected from the group consisting of substantially oxide-free aluminum and silicon, from about 2% to about 10% nickel, from about 3% to about 16% copper, and the balance comprising substantially electrolytic manganese. No. 2,242,205. Clarence T. Anderson to Chicago Development Co.

A cyclic process for the lixiviation of copper ores and the subsequent recovery of copper. No. 2,242,217. Arturo Amenabar to Ovalle, Tupper & Amenabar, Ltd.

Process for melting and refining ferrous metals. No. 2,242,219. Thaddeus F. Bailey.

Silicon steel strip or sheet stock having a carbon content not substantially exceeding .01% characterized by the substantial absence of cementite and pearlite having a coarse grained structure of an average grain size of at least .01 inch having freedom from coil set, a core loss which measured in the rolling direction does not vary more than 6% from that measured in any other direction, and further characterized by excellent die life, ductility and space factor, and good magnetic properties substantially approaching isotropic magnetic properties. No. 2,242,234. Victor W. Carpenter to The American Rolling Mill Co.

Method of increasing the hardness of fabricated ductile metals of the chromium group. No. 2,242,254. William E. Mansfield to Cleveland Tungsten, Inc.

Process of removing silica from minerals slags and similar materials. No. 2,242,497. Eduard Zintl, Walter Krings and Wilhelm Brauning to Walther H. Duisberg.

Process for the recovery of vanadium from oils containing same. No. 2,242,675. Hendrik J. Jakob to Shell Development Corp.

Method of making magnesium. No. 2,242,721. Joseph D. Hanawalt and Ludo K. Frevel to The Dow Chemical Co.

Nickel alloy. No. 2,242,865. Theodore E. Kihlgren to The International Nickel Co., Inc.

Thermal treatment of aluminum base alloys. No. 2,242,944. Edgar H. Dix, Jr. and Joseph A. Nick to Aluminum Co. of America.

Electrical resistance element consisting essentially of substantially 40%

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manganese, 10 to 15% copper and the balance iron. No. 2,242,970. Erich Fetz to Wilber B. Driver Co.

A workable gold alloy having a purple colored shade consisting of 75 parts of gold, 24.25 parts of aluminum, 0.25 parts of thorium and 0.5 parts of tin. No. 2,243,023. Ludwig Weiss to Chemical Marketing Co., Inc.

Process for the manufacture of working pieces impermeable to gas and vacuum proof. No. 2,243,059. Hans Bernstorff to Chemical Marketing Co., Inc.

An abrasive tool comprising finely divided particles of a plurality of metals of different degrees of hardness abrasive granules and a non-metallic binder, molded into an integral body, the metal particles by weight exceeding the abrasive granules. No. 2,243,105. Paul L. Kuzmick to J. K. Smit & Sons Inc.

In process of electrolytic detinning decorated or undecorated tin, tin scrap or tin alloys with copper, antimony and lead without any initial washing treatment, the step of treating said tin product as anode in an aqueous electrolytic bath containing free caustic alkali and a small quantity of cobalt oxide under current conditions depositing a cathode mud containing tin and tin oxide. No. 2,243,165. Martin Mandl to The Standard Metal Refining Co.

A workable gold alloy having a purple colored shade consisting of from about 68.5% to about 78.5% gold, from about 0.5% to about 10% thorium and the remainder substantially all aluminum, the aluminum constituting not over 24.25% of the alloy. No. 2,243,177. Ludwig Weiss to Chemical Marketing Co., Inc.

Process of producing metal embossing foils. No. 2,243,237. Cecil Whiley.

An alloy containing about .5% magnesium, about 1% cadmium, about .5% chromium and the balance substantially all copper. No. 2,243,276. Franz R. Hensel and Earl I. Larsen to P. R. Mallory & Co., Inc.

An alloy of the character and for the purposes described which consists of tin from about 56 to 60%, cadmium from about 20 to 24%, zinc from about 14 to 16%, copper from about 1 to 5% and silver from about 2½ to 3%. No. 2,243,278. John Johnson.

A flux for welding or soldering aluminum comprising a halogenide of cadmium, a halogenide of copper and halogenides of alkali metals. No. 2,243,424. Oskar Horowitz to Albert I. Elias.

Casting of metals and/or metal alloys and more particularly to a method of maintaining a uniform rate of flow of the molten mass into the mold or chill. No. 2,243,425. Siegfried Junghans to Irving Rossi.

Process of making an aluminum bonding metal. No. 2,243,489. Frank B. Smith to Stolac Laboratories.

Desulfurization of cast iron. No. 2,243,514. Kjell Magnus Tigerschiold.

Process for electrodeposition of zinc and anode therefor. No. 2,243,696. Eric W. Ferm to E. I. du Pont de Nemours & Co.

Production of chromium-bearing reaction mixtures and alloys. No. 2,243,783. Marvin J. Udy.

A solid agglomerate for use in the production of molten metallic iron comprising particles of ferrosilicon intimately associated with and bonded together by means of oxidizing material capable of reacting with the silicon of the ferrosilicon to generate sufficient heat to melt the iron of the ferrosilicon. No. 2,243,784. Marvin J. Udy.

The method of treating chromite ore to prepare a charge suitable for smelting with a carbonaceous reducing agent to reduce chromium contained in the ore to the metallic state which comprises grinding the chromite ore, and subjecting the ground ore product to a sintering treatment in the presence of lime to form an agglomerated product containing ore particles and lime in intimate association. No. 2,243,785. Marvin J. Udy.

A solid agglomerate suitable for use in metallurgical operations containing solid particles comprising a reducing agent intimately associated with and bonded together by means of oxidizing material containing oxygen available for reaction with the reducing agent and capable upon ignition of the agglomerate of reacting exothermically with the reducing agent. No. 2,243,786. Marvin J. Udy.

Method of forming a colored design integral with the surface of stainless steel. No. 2,243,787. Clements Batcheller to Allegheny Ludlum Steel Co.

A zinc alloy containing about 0.1 to 0.2% silver, a trace and up to about 0.35% manganese, about 0.4 to about 1% aluminum and about 0.5% copper with the remainder substantially all zinc. No. 2,243,827. Richard Schulze to General Electric Co.

A steel body provided with a coating consisting of an inorganic nitrite. No. 2,243,853. James B. Castner to E. I. du Pont de Nemours & Co.

Production of aluminum-coated iron or steel. No. 2,243,979. Richard S. Reynolds to Reynolds Metals Co.

Method of drawing metal blanks. No. 2,243,986. Thomas F. Stacy to The French Oil Mill Machinery Co.

An alloy for making castings including substantially 5.5% to 6.5% of aluminum, substantially 1 to 3% of copper, substantially 0.15% to 0.25% of silicon and zinc to constitute the remaining percentage of the alloy. No. 2,244,146. John P. Gerhauser to The Mantle Lamp Co.

Process for extraction of alumina. No. 2,244,194. Ture R. Haglund.

Machine for producing expanded metal. No. 2,244,305. William M. McNeil and Bernard T. Ballard to United States Gypsum Co.

Protected metal article and method of making the same. No. 2,244,352. James H. Young and Paul W. Jenkins to H. H. Robertson Co.

Method for the production of steel. No. 2,244,385. Herman A. Brassert to H. A. Brassert & Co.

A cast alloy comprising as essential elements: boron 0.25% to 2.50%, tungsten 5% to 20%, molybdenum 1% to 15%, chromium 1% to 10%, iron 5% to 40%, carbon up to a maximum of 0.75%, the balance cobalt, except for minor amounts of incidental impurities; said cast forms being characterized by being responsive to thermal treatment for the regulation of hardness. No. 2,244,517. Anthony G. de Golyer.

A process of coating articles of iron, copper, aluminum and alloys of each of them, which comprises fusing together a mixture of alkali metal compounds including alkali metal nitrate as the essential ingredient together with alkali metal hydroxide and manganese dioxide, the resulting mass being in the molten state reactive with the metal treated to produce a coating thereon, and subjecting the articles to the action of the molten mass. No. 2,244,526. Cecil J. MacKay to Rust Proofing Co.

Process of making alloys of aluminum beryllium. No. 2,244,608. Hugh S. Cooper to Cooper-Wilford-Beryllium, Ltd.

Paints and Pigments

A luminescent material highly responsive to the 2573 A. mercury line comprising a heat-treated combination of manganese-activated zinc silicate with an addition of up to 25% of at least one metallic sesquioxide of the general formula M_2O_3, said material having a response to the 2537 A. mercury line substantially greater than that of manganese-activated zinc silicate without the said addition. No. 2,241,939. Gunther Aschermann and Ernst Friederich to General Electric Co.

Luminescent materials. No. 2,241,950 and 2,241,951. Magdalene Huniger and Hans Panke to General Electric Co.

A pigment material being a calcination product of a manganese oxide yielding material other than a manganese salt of a strong mineral acid aluminum hydrate and a minor quantity of calcium fluoride manganese oxide being present to the extent of from 5% to 20% of the aluminum. No. 2,243,033. Carl J. Harbert to The Harshaw Chemical Co.

Paper and Pulp

Papermaking pulp mixture and method of producing same. No. 2,242,087. Joseph E. Plumstead to West Virginia Pulp & Paper Co.

Petroleum

Process of treating hydrocarbons. No. 2,241,393. Philip S. Danner to Standard Oil Company of California.

Process subjecting a petroleum fraction to a plurality of reforming operations. No. 2,241,430. Alvah L. Snow to Standard Oil Co. of California.

Improved diesel fuel comprising a hydrocarbon fuel and dissolved therein a minor proportion of a nitroalkyl monoitrate in a sufficient quantity to impart improved ignition qualities to the fuel. No. 2,241,492. Byron M. Vanderbilt to Standard Oil Co.

Lubricant adapted for the cold working of metals. No. 2,241,547. George W. Flint to Standard Oil Company.

Process for producing normally liquid hydrocarbons from normally gaseous hydrocarbons. No. 2,241,716 and 2,241,717. George Roberts, Jr. and George W. Robinson to The Polmerization Process Corp.

Method and apparatus for treating hydrocarbons. No. 2,242,110. Samuel C. Carney to Phillips Petroleum Co.

Method of recovering desirable liquefiable constituents from natural gas which is initially at a high pressure within the retrograde condensation range of said constituents. No. 2,242,173. Stuart E. Buckley to Standard Oil Development Company.

Lubricating compound, comprising an oil of lubricating viscosity having an incorporated sulfur compound and a lead salt consisting of a salt whose acid component is an oxidation acid of oxidation of petroleum hydrocarbons of 350-550° F. B. P. No. 2,242,174. Robert E. Burk and Herman P. Lankelma to The Standard Oil Co.

Reissue. In transfer of water into an earth bore the method of preventing clogging of said earth bore into which is injected said water containing soluble compounds which precipitate upon oxidation which comprises maintaining the water at its source under an inert fluid capable of forming a protective blanket over the surface of the water, transferring the water from its source to the injection bore in the absence of air or oxygen and injecting the water without treatment to remove said compounds therefrom into the injection bore under a blanket of inert fluid. No. 21,809. Cary R. Wagner and Richard H. Carr to The Pure Oil Co.

Method of converting hydrocarbon oils into more valuable products. No. 2,242,255. Percy Mather to Universal Oil Products Co.

Process for the segregation and recovery of vaporized constituents from a feed gas mixture. No. 2,242,299. Paul J. Harrington and George D. Priestman to Standard Oil Development Co.

Production of nonknocking motor fuels, consists in catalytically cracking hydrocarbons obtained from carbon monoxide by reaction with hydrogen mixed with a paraffin-base petroleum oil. No. 2,242,321. Mathias Pier and Gerhard Free to William Ellyson Currie.

Method of catalytically desulfurizing light naphtha. No. 2,242,387. George A. Boyd to Standard Oil Company.

Extreme pressure lubricant containing from about 0.01% to about 5% of tetra chloropropyl silicate. No. 2,242,400. Clarence M. Loane and Bernard H. Shoemaker to Standard Oil Co.

Method of dehydrogenating low boiling paraffinic hydrocarbons into olefinic hydrocarbons of the same number of carbon atoms. No. 2,242,488. Carlisle M. Thacker to The Pure Oil Corp.

Process for producing anti-knock gasoline which comprises extracting hydrocarbon oil with a selective solvent separating the resultant raffinate and extract, subjecting the raffinate to dehydrogenation, hydrogenating the extract catalytically cracking the dehydrogenated raffinate and the hydrogenated extract, separating gasoline and a hydrogen-containing gas from the cracked products recovering the gasoline and supplying at least a portion of said gas to the aforesaid hydrogenating step. No. 2,242,504. Wayne L. Benedict and Jacob E. Ahlberg to Universal Oil Products Co.

Conversion process which comprises contacting hydrocarbon oil at cracking temperature with a calcined mixture of a major proportion of precipitated silica and minor proportions of precipitated alumina and thoria. No. 2,242,553. Charles L. Thomas and Herman S. Bloch to Universal Oil Products.

Process of sweetening hydrocarbon oil with copper reagents, the step of stabilizing the sweetened oil to prevent deteriorization due to retained oil soluble copper salts which comprises adding a small quantity of stabilizing agent comprising dithizone. No. 2,242,621. Walter A. Schulze and Graham H. Short to Phillips Petroleum Co.

Process for stabilization of copper treated oils. No. 2,242,622 to 2,242,625. Walter A. Schulze and Graham H. Short to Phillips Petroleum Co.

Hydrogenation catalyst and process. No. 2,242,627. Thomas G. Strickland to Phillips Petroleum Co.

Method of operating polymerization plants. No. 2,242,771. Harold J. Baker, Jr. and William Mendius to Sinclair Refining Co.

Process of preparing alkyl aromatic compounds in the gasoline boiling range. No. 2,242,960. Alexander N. Sachanen and Arlie A. O'Kelly to Socony-Vacuum Oil Co.

A motor fuel product comprising cracked hydrocarbon distillates of the character of gasoline which normally tend to deteriorate and develop gum said product containing a small proportion of a naphthalene diamine in quantity sufficient to retard such gum formation. No. 2,243,168. Thomas H. Rogers and Vanderveer Voorhees to Gasoline Antioxidant Co.

Conversion of hydrocarbon oils. No. 2,243,291. Jean D. Seguy to Universal Oil Products Co.

Process for manufacture of gasoline and iso-octane. No. 2,243,298. Charles L. Thomas to Universal Oil Products Co.

Conversion of hydrocarbon oils. No. 2,243,315. Bernard L. Kramer to Universal Oil Products Co.

Process for breaking petroleum emulsions. No. 2,243,329. Melvin De Groote and Charles M. Blair, Jr. to Petrolite Corp. Ltd.

Process for breaking petroleum emulsions. No. 2,243,330. Melvin De Groote and Bernhard Keiser to Petrolite Corp. Ltd.

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U. S. Chemical Patents

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Improved lubricating oil comprising a viscous hydrocarbon oil containing a small amount of a synthetically prepared ester having a boiling point above 150° C. of a mixture of acids produced by the low temperature oxidation of paraffiin wax. No. 2,243,420. Per K. Frolich to Standard Oil Company.

As a lubricating composition a mineral oil of lubricating viscosity and a small amount of an arylethyleneamine compound from the group consisting of phenyl and tolyl derivative with a carboxylic acid of the group consisting of fatty acids of at least ten carbon atoms and naphthenic acid. No. 2,243,485. John M. Musselman to The Standard Oil Co.

Low temperature active polymerization catalyst. No. 2,243,658. Robert M. Thomas and Ober C. Slotterbeck to Standard Oil Development Co.

A fuel for driving diesel motors consisting of paraffinic oils obtained by the catalytic reduction of carbon monoxide to hydrocarbons and having boiling points ranging from 200°C. to 320° C. and of carbonaceous products poor in hydrogen in simple admixture. No. 2,243,760. Friedrich Martin, Otto Roelen and Paul Schaller to Ruhrchemie Aktiengesellschaft.

Process for refining hydrocarbon distillate which comprises sweetening said distillate with a copper-containing reagent separating the distillate treating said distillate in the presence of a heavy metal sulfosilicate to remove copper therefrom and recovering the sweet gasoline. No. 2,243,824. Wayne L. Benedict and Jacob E. Ahlberg to Universal Oil Products Co.

Method of synthesizing liquid hydrocarbons. No. 2,243,869. Percival C. Keith, Jr. and John T. Ward and Dustin W. Wlson to The M. W. Kellogg Co.

Method of carrying out catalytic reactions. No. 2,244,018. John C. Munday and Edward W. Nicholson to Standard Oil Development Co.

An improved lubricant comprising a hydrocarbon oil and a small amount of an aromatic sulfonamide. No. 2,244,075. Louis A. Mikeska to Standard Oil Development Co.

Process preparing solvents from light petroleum distillates. No. 2,244,164. Arthur Lazar and Thomas F. McCormick to Tide Water Associated Oil Co.

Catalytic production of hydrocarbons. No. 2,244,196. Wilhelm Herbert to American Lurgi Corp.

Method of solvent dewaxing. No. 2,244,407. Walter Smisloff to The Texas Co.

Method of filtration in the dewaxing of lubricating oil. No. 2,244,412. Charles T. Anné and Laurance V. Phillips and William Schwarz to The Texas Co.

A lubricating oil containing a phosphatide. No. 2,244,416. Harry V. Ashburn and William G. Aslop to The Texas Co.

Compression ignition fuel comprising fuel oil boliing above the gasoline boiling range and a compound from the group consisting of diamylene nitrosite and diamylene nitrosate, said compound being present in an amount sufficient to substantially increase the cetane number of the fuel oil. No. 2,244,496. Ernest M. Marks to The Atlantic Refining Co.

Selective solvent refining process for mineral oils. No. 2,244,521. Seymour W. Ferris and Edwin R. Birkhimer to The Atlantic Refining Co.

Process of manufacturing high anti-knock motor fuel constituents boiling in the aviation gasoline boiling range from cracking still gases containing a mixture of isoparaffiin, normal paraffin, and olefin. No. 2,244,556. Melvin M. Holm and Eugene H. Oakley and Robert L. Humphreys to Standard Oil Company of Calif.

Cracking hydrocarbon oils. No. 2,244,632. Edward D. Phinney to Gasoline Prods. Co.

Treatment of hydrocarbons. No. 2,244,636. Harold V. Atwell to Process Management Co.

Resins, Plastics

Method of producing an oil-soluble, phenolic resin which is capable of yielding nonpenetrating varnishes. No. 2,241,422. Israel Rosenblum.

Molded composition of matter comprising a resin, a filler and an extract obtained by the solvent extraction of petroleum lubricating oils with beta-beta'-dichlorethyl ether, said extract being characterized by a low iodine value. No. 2,241,538. William I. Buckeridge to Standard Oil Company.

Plastic impression material comprising in part sorbitol and agar-agar in relative proportions to form a colloidal mass as a base for molding and casting purposes. No. 2,241,875. Carl D. Clarke.

A laminated glass comprising at least two sheets of glass and at least one intermediate layer comprising a condensation product of a polyvinyl alcohol with methylcyclohexanone and the neutral ester of diglycolic acid with methylcyclohexanol. No. 2,242,019. Adolf Weihe to General Aniline & Film Corp.

Process comprising refluxing one mol of urea with two mols of formaldehyde in aqueous solutions at a pH of 3-6 until a high viscosity sirup with a resin content of about 50% is obtained, said viscosity being between about 50 and 450 centipoises, neutralizing the sirup thus formed, removing about 10-20% of the solvent material and adding sufficient ethanol to the concentrated sirup to obtain a concentration of ethanol in the finished product between about 10% and 20% thereby producing a stable resinous sirup which may be diluted with as much as 10 parts water without precipitation of the resin. No. 2,242,484. Paul C. Schroy and Raymond P. Hofferbert to American Cyanamid Corp.

Thermoplastic sheet suitable for making box toes and the like. No. 2,242,729. Roy S. Ritchie to The Dow Chemical Co.

A heat-cured composition of matter which is more resistant than rubber to the solvent action of coal-tar solvents, said composition including an alkyd resin which is unstable in the presence of heat and moisture, said composition also including polymerized chloro-2-butadiene-1, 3, the percentage of polymerized chloro-2-butadiene-1, 3, being substantially from 10% to 60% of the total weight of the alkyd resin and the polymerized chloro-2-butadiene-1, 3. No. 2,243,386. Robert R. Lewis and Albert J. Weiss to Vulcan Proofing Co.

A resin produced by reacting furfuryl alcohol and a substance selected from the group consisting of lignin-sulfonic acids and salts thereof. No. 2,243,481. John G. Meiler to Marathon Paper Mills Co.

An insulated electrical conductor in which the insulation comprises a combination of spun glass and polyvinylal resin. No. 2,243,560. Ralph W. Hall and Henry A. Smith to General Electric Company.

A composition of matter comprising a protein plastic and a salt of an acid of the formula R-O-CnH2n wherein n represents a whole number less than six and R represents an aryl nucleus substituted with at least four carbon atoms of which at least three occur in the same substituent group. No. 2,243,644. Robert J. Myers to The Resinous Products & Chemical Co.

A synthetic linear polyamide plasticized with a carboxylic acid having a boiling point above 200° C., the said polyamide being the reaction product of a polymer-forming composition comprising reacting materials selected from the class consisting (a) polymerizable monoaminomonocarboxylic acids, and (b) mixtures of diamine and dibasic carboxylic acid; the said polyamide having an intrinsic viscosity of at least 0.4. No. 2,243,662. Gordon T. Vaala to E. I. du Pont de Nemours & Co.

Molding composition and method of making. No. 2,243,700. Robert P. Gutterman.

Liquid dispersions of carbon black and vinyl resins. No. 2,244,020. Carl W. Patton to Carbide & Carbon Chemicals Corp.

A polymer composition of increased stability toward heating comprising essentially an isobutylene polymer having a molecular weight above about 27,000 and 0.01% to 5% of an aromatic compound containing a—XH group attached to the aromatic nucleus, in which X is a negative element of the sixth group of the periodic system. No. 2,244,021. Raphael Rosen and Robert M. Thomas to Standard Oil Development Co.

A synthetic linear polyamide plasticized with a sulfonamide-formaldehyde reaction product. No. 2,244,183. Paul R. Austin to E. I. du Pont de Nemours & Co.

Process which comprises reacting under condensation reaction conditions a diprimary diamine and a dibasic dicarboxylic acid in approximately equimolecular amount with at least one mol of urea per two mols of diamine and reacting this reaction product with formaldehyde. No. 2,244,184. Paul R. Austin and Boynton Graham to E. I. du Pont de Nemours & Co.

A plastic composition comprising caoutchouc and, as a plasticizer, resinic alcohol. No. 2,244,263. Walther Schrauth and Stefan Morgenstern to "Patchem A.-G. Zur Beteiligung An Pantenten Und Sonstigen Erfindungsrechten Auf Chemische Verfahren."

Multicolored molded product and method of making the same. No. 2,244,565. Leo Nast to Universal Plastics Corp.

Rubber

Process which comprises vulcanizing neoprene in the presence of an alkali metal silicate. No. 2,241,801. Robert V. Yohe and Arthur W. Browne to The B. F. Goodrich Co.

Process producing a vulcanizable rubber composition which comprises incorporating with the rubber a vulcanizing agent, a diaryl guanidine, activatable organic accelerator, and the non-hygroscopic resin-like, amorphous addition product of zinc chloride and a diaryl guanidine. No. 2,242,208. Arnold R. Davis to American Cyanamid Company.

Method of finishing the surfaces of uncured rubber objects which comprises providing the external surfaces thereof with a coating comprising a dispersion of carbon black in a fluid dispersion medium, subsequently permitting said coating to set and vulcanizing the uncured rubber object thus coated. No. 2,242,264. George L. Roberts.

The process of vulcanizing rubber or a rubber containing material which comprises heating rubber or a rubber containing material and sulfur in the presence of a product obtained by reacting a mono N-alkyl cyclohexylamine containing one hydrogen atom on the amino nitrogen atom with an aldehyde in the ratio of substantially two molecular proportions of amine and one aldehyde, and further reacting the product so obtained with carbon bisulfide. No. 2,243,171. Robert L. Sibley to Monsanto Chemical Co.

A lining material for a boot or shoe comprising a fabric napped on one side, said nap being rubberized with a heavily loaded vulcanized rubber stock containing an inorganic filler in an amount of from .7 to 2.8 parts by volume to 1 part by volume of rubber. No. 2,243,969. Joseph M. Lurie to W. S. Libbey Co.

Method of reclaiming rubber. No. 2,244,654. Fritz Rostler and Vilma Mehner.

Textiles

Process of producing composite yarns. No. 2,241,442. Angus S. Bell and Joseph R. Wylde to Celanese Corp. of America.

Process for producing water-repellent textile materials and products therefrom. No. 2,242,051. Hans Beck to Heberlein Patent Corp.

Improvement in method of sizing textiles. No. 2,242,218. Laszlo Auer.

Spin bath, adapted for use in the manufacture of regenerated cellulose, containing about 0.4 to 1.0 gram per liter of a cation-active condensation product of a halogenated hydrocarbonaceous material selected from the group consisting of crude petroleums, gasolines, kerosenes, lubricating oils, pasty petrolatums, liquid petrolatums and paraffin waxes and an organic sulfide said condensation product being sufficiently soluble and stable in said setting bath to become cation-active therein. No. 2,242,225. Rudolph S. Bley to North American Rayon Corp.

Spin bath adapted to be used in the manufacture of regenerated cellulose from viscose solutions containing about 0.4 to 1.0 gram per liter of a cation-active condensation product of a halogenated hydrocarbonaceous material selected from the group consisting of crude petroleums, gasolines, kerosenes, lubricating oils, pasty petrolatums, liquid petrolatums and paraffin waxes and a tertiary base selected from the group consisting of amines, phosphines, arsines and stibines, said condensation product being sufficiently soluble and stable in said bath to become cation-active therein. No. 2,242,226. Rudolph S. Bley to North American Rayon Corp.

Apparatus for use in the manufacture of rayon. No. 2,242,682. Hans Alwin Schrenk to American Enka Corp.

Method and apparatus for manufacture of rayon. No. 2,243,000. Alfred S. Brown to Skenandoa Rayon Corp.

Process of producing spinnable fibers and cellulose from plants. No. 2,243,050. Hendricus Plant to N. V. Exploitatie Maatschappij voor Chemische Utvindingen.

Process of producing textile yarns. No. 2,243,085. Harry R. Buckley to Celanese Corp. of America.

Process for improving the properties of textile materials having a basis of an organic derivative of cellulose, which comprises subjecting the materials in the absence of tension sufficient to stretch them to the action of a medium comprising a halogenated hydrocarbon as a latent solvent, and an aliphatic polybasic carboxylic acid in a proportion less than 1% of the medium. No. 2,243,705. Frank B. Hill and Thomas Jackson to Celanese Corp. of America.

Treatment of cellulosic textile materials. No. 2,243,765. Thomas H. Morton to Courtaulds Ltd.

Process for the production of crepe fabrics. No. 2,243,843. Donald Finlayson, Ernest Greenwood and Thomas P. Dee to Celanese Corporation.

Process for the production of fabrics exhibiting crepe effects. No. 2,243,858. Bernard J. Flanagan and Albert Mellor to Celanese Corporation of America.

Corrosion resistant yarn and fabric. No. 2,243,917. Robert S. Owens.

Process of softening textiles. No. 2,243,980. Alfred Rheiner and Jakob Link to Sandoz Ltd.

Process and apparatus for yarn winding. No. 2,244,492. George M. Karns to E. I. du Pont de Nemours & Co.

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Abstracts of Foreign Patents

Collected from Original Sources and Edited

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Those making use of this summary should keep in mind the following facts:

Belgian and Canadian patents are not printed. Photostats of the former and certified typewritten copies of the latter may be obtained from the respective Patent Offices.

English *Complete Specifications Accepted* and French patents are printed, and copies may be obtained from the respective Patent Offices.

In spite of present conditions, copies of all patents reported are obtainable, and will be supplied at reasonable cost by E. L. Luaces, 1107 Broadway, New York.

This digest presents the latest available data, but reflects the usual delays in transportation and printing. We expect to begin reporting German patents in the near future. Your comments and criticisms will be appreciated.

CANADIAN PATENTS

Granted and Published December 31, 1940.

Vulcanized rubber insulating compound. No. 393,481. Canadian General Electric Co., Ltd. (Emil W. Schwartz, Manuel H. Savage and Francis C. Spargo.)

Fused salt electrolyte cell. No. 393,484. Canadian Industries Limited. (Robert E. Hulse, Virgil L. Hansley and Herman G. Laughton.)

Metal having a coating of baked varnish comprising gilsonite heated until the fixed carbon content thereof has increased 20-65%. No. 393,485. Canadian Industries Limited. (James K. Hunt and Joseph H. Shipp.)

Ozone control in electrostatic precipitators. No. 393,504. Canadian Westinghouse Co., Ltd. (Gaylord W. Penney.)

Electrostatic precipitator. No. 393,505. Canadian Westinghouse Co., Ltd. (Gaylord W. Penney.)

Dehydrating alcohol by adding diisopropyl ether to the aqueous alcohol and distilling the mixture. No. 393,507. Carbide and Carbon Chemicals Limited. (Alan Marples.)

Preparing 2-ethylbutyraldehyde by the catalytic hydrogenation of 2-ethylcrotonaldehyde. No. 393,508. Carbide and Carbon Chemicals Limited. (Henry L. Cox.)

Method of forming stiffening material comprising a base impregnated with a plastic material. No. 393,509. Celluloid Corp. (Ernest Schweizer.)

Valve element for internal combustion engines made of an alloy containing over 20% to about 30% chromium, about 0.5-2% carbon, and the balance substantially iron. No. 393,512. Crucible Steel Co. of America. (Peter Payson, Lewis S. Bergen and Walter L. Hodapp.)

Treatment of manganese-bearing ferruginous ores for simultaneously producing in a single smelting step pig iron and manganese slag. No. 393,514. Electro Metallurgical Co. of Canada Ltd. (Julian M. Avery.)

Chromium steel having in the fully annealed state an impact strength at least 30 foot pounds Izod. No. 393,515. Electro Metallurgical Co. of Canada Limited. (Russell Frank.)

Acid concentrating apparatus and alloy therefor. No. 393,525. Hercules Powder Co. (Charles L. Jones.)

Machineable alloy steel. No. 393,530. Inland Steel Co. (Oscar E. Harder.)

Preparation of cisandrosterone from beta-cholestanol. No. 393,545. Parke, Davis & Co. (Russell E. Marker.)

Process of preparing intermediate compounds useful for later conversion into estrogenic compounds. No. 393,546. Parke, Davis & Co. (Thomas S. Oakwood.)

Preparation of androstanedione and similar compounds. No. 393,547. Parke, Davis & Co. (Russell E. Marker, David M. Jones and Thomas S. Oakwood.)

Water pollution protecting device for water supply distributing system. No. 393,548. John B. Pierce Foundation. (William C. Groeniger.)

Production of an isobutenyl diethyl malonate. No. 393,557. Shell Development Co. (Herbert P. A. Groll and Clarence J. Ott.)

Ethylene sulfide stabilized against deterioration under ordinary storage and transportation conditions by addition thereto of a stabilizing amount of hyrogen sulfide. No. 393,558. Shell Development Co. (William Coltof and Siegfried L. Langedijk.)

Emulsion containing over 50% of a blend of about 20% propane precipitated asphalt obtained from a reduced asphalt containing petroleum crude oil that had not been subjected to a temperature higher than 400°F and about 80% of a straight high temperature reduced asphalt, about 0.13% caustic soda, 0.7% bentonite and water to make 100%. No. 393, . Standard Oil Development Co. (William J. Sweeney and Kenneth C. Laughlin.)

Olefin dispersion in acid polymerization. No. 393,560. Standard Oil Development Co. (Bruno E. Roetheli and Eldon E. Stahly.)

Production of valuable hydrocarbon polymers of high molecular weight. No. 393,561. Standard Oil Development Co. (Lewis A. Bannon.)

Process of recovering boron fluoride catalyst from reaction liquids. No. 393,562. Standard Oil Development Co. (Anthony H. Gleason.)

High molecular weight halogenated organic compounds obtained by halogenation of material consisting of substantially saturated linear hydrocarbon polyymer of the aliphatic series having a molecular weight in excess of about 1000 and a plurality of short alkyl side chains. No. 393,563. Standard Oil Development Co. (Robert M. Thomas, Arnold J. Morway and Floyd L. Miller.)

Nose drops containing, in addition to therapeutic ingredients, a small amount of pectin having a pH in excess of 4.5 in 1% aqueous dispersion, the nose drops having a pH value between about 4.5 and 8. No. 393,576. Vicks Chemical Co. (John H. Wright.)

Pulp screening apparatus. No. 393,578. Waterous Limited. (George P. Brown.)

Homogeneous liquid mixture which comprises a 9-polyhydroxyalkylisoalloxazine and an N-alkylated amide of a lower fatty acid, which amide is in the liquid state. No. 393,581. Winthrop Chemical Co. (Ernst Auhagen.)

Corrosion resistant ferrous alloy sheet. No. 393,583. Alan Wood Steel Company. (Victor H. Lawrence.)

Process of producing remedy for diabetes by adding vasoconstrictor constituent of the pituitary hormone won from the posterior lobe of the hypophysis to the anti-diabetic principle of the pancreas. No. 393,586. George Haugwitz. (Richard Spangenberg.)

Electrolytic cell for aqueous saline solutions. No. 393,596. I. G. Farbenindustrie A. G. (Georg Messner.)

Manufacture of vinyl halide by addition of hydrogen halide to acetylene in presence of a mercury compound. No. 393,597. I. G. Farbenindustrie A. G. (Carl Jung.)

Preparing aluminates by directly heating a mixture of a member of the group consisting of bauxite alunite, aluminum sulfate and aluminum sulfite with a member of the group consisting of alkali and alkaline earth sulfates. No. 393,598. I. G. Farbenindustrie A. G. (Hans Zirngibl.)

Replacing halogen in cyclic halogen compounds by heating with cuprous cyanide. No. 393,599. Willy Braun and Karl Koeberle.

Improving properties of organic, thermoplastic, film-forming polymerization products. No. 393,600. Hans Fikentscher and Heinrich Jacqué.

Granted and Published January 7, 1941.

Live-stock feed comprising grass juice obtained from grass harvested near the jointing stage. No. 393,642. American Dairies, Inc. (Charles F. Schnabel).

Composition metallic and ceramic body. Nos. 393,654 and 393,655. Canadian General Electric Co., Ltd. (Hans Pulfrich).

Reacting acetylene with a carboxylic acid in presence of a mercury compound of a heteropoly acid. No. 393,700. Carbide and Carbon Chemicals Ltd. (Walter J. Toussaint).

Chocolate milk powder comprising milk powder, sugar, cocoa, and a small percentage of an added alkaline deflocculating agent, selected from the group consisting of calcium oxide and magnesium oxide. No. 393,706. De-Raef Corp. (Ernest D. Fear.)

Methods of treating wells. Nos. 393,712; 393,713 and 393,714. The Dow Chemical Co. (John J. Grebe.)

Method of acidifying wells in a calcareous formation. No. 393,715. The Dow Chemical Co. (Paul G. Shelley.)

Preparation of adiponitrile from ammonia and a compound selected from adipic acid adipamide, adipamide, an ester of adipic acid, omega-cyanovaleric acid, adipamic acid and amega-cyanovaleramide over a dehydration catalyst at 320-400°C with 1-10 seconds contact. No. 393,716. E. I. du Pont de Nemours & Co. (Wilbur A. Lazier.)

Process of finishing a fabric containing vegetable fibre to obtain a good mercerization sheen and improved stability against shrinkage. No. 393,734. Heberlein Patent Corp. (Ernst Weiss.)

Manufacture of ethers of 2-methyl-2-hydroxy-3-chlor-tetrahydrofurane by reacting an aliphatic primary alcohol with aceto-chloro-butyrolactone in presence of sulfuric acid at moderate temperature. No. 393,735. Hoffman-LaRoche Limited. (Max Klingenfuss.)

Method for the manufacture of cavitated plastic masses. No. 393,742. Imperial Chemical Industries Ltd. (Victor Lefebure and John B. Sandford.)

Apparatus for coating a web of material. No. 393,748. K. C. M. Company. (Warren George.)

Alkali mercerizing liquor to which has been added a compound having the formula R-O-C_2H_4OH wherein R is an alkyl phenyl group which is sulfonated in the phenyl ring. No. 393,773. Röhm & Haas Co. (Herman A. Bruson and Clinton W. MacMullen.)

Method for treating wells. No. 393,775. Shell Development Company. (Fritz Bresler.)

Producing viscous polymerization products soluble in mineral lubricating oils in presence of an ester formed by reacting an unsaturated aliphatic acid and an aliphatic alcohol containing not more than 2 hydroxy groups. No. 393,776. Shell Development Co. (Egon Eichwald.)

Removal of gyp scale from wells. No. 393,777. Shell Development Co. (Albert G. Loomis, Harold T. Byck and James F. Fidiam, Jr.)

Apparatus for producing calcium sulfite. No. 393,790. West Virginia Pulp & Paper Co. (Gerald Haywood.)

Method of reducing natural silk to the form of an impalpable powder. No. 393,791. Reginald Wyatt Lawson and Joseph Percy Shaw. (Reginald W. Lawson.)

Production of crepe effects on fabric containing high twist crepe yarns of an organic ester of cellulose. No. 393,796. Henry Dreyfus. (Bernard J. Flanagan and Albert Miller.)

Production of high tenacity regenerated cellulosic materials of improved affinity for cotton dyes. No. 393,797. Henry Dreyfus. (Albert Mellor, Ralph J. Mann and Robert W. Noon.)

Production of crepe effects on fabrics containing high twist yarns of

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regenerated cellulose and high tenacity yarns of regenerated cellulose. No. 393,799. Henry Dreyfus. (Ralph J. Mann and Albert Mellor.)

Aluminum base alloys comprising silicon and magnesium in proportions such that the quantity of silicon does not exceed that required for the formation of about 3% of Mg_2Si, whereas the quantity of magnesium does not exceed about 7% of the weight of the alloy, and further quantity of cerium ranging between about 0.1 and 0.5%. No. 393,808. I. G. Farbenindustrie A. G. (Adolf Beck and Erhard Kröner.)

Production of derivatives of tertiary amino aliphatic acids wherein the hydroxyl of the carboxyl group is replaced. No. 393,809. Merck & Co., Inc. (Otto Dalmer, Claus Diehl and Hartmann Pieper.)

Producing an ester of an N-alkyl-piperidine-carboxylic acid with a carbocyclic hydroxyl compound. No. 393,810. Merck & Co., Inc. (Otto Dalmer and Claus Diehl.)

Producing esters of N-alkyl-piperidine-carboxylic acids with a compound selected from the group consisting of mono- and di-alkyl, alkoxy, and carbalkoxy derivatives of a carbocyclic hydroxyl compound. No. 393,811. Merck & Co., Inc. (Otto Dalmer and Claus Diehl.)

Manufacturing artificial material from substances of the group consisting of polyvinyl chloride, subsequently chlorinated polyvinyl chloride, and polyvinyl chloride mixed polymers, by adding softening agents containing at least one aromatic group, and at least one aliphatic group whose carbon chain contains more than 10 carbon atoms. No. 393,812. Siemens-Schuckerwerke A. G. (Hans Müller.)

Rotary oven for coal and process of heating coal for realizing a globular transformation of the coal particles. No. 393,813. Société Financière de Transports et d'Entreprises Industrielles (Sofina) S. A. (Gaston C. Henry and Henri F. J. Baptist.)

Treating bath for producing colored photographic pictures. No. 393,814. Bela Gaspar. (Paul Goldfinger.)

Colored photographic multilayer material. Nos. 393,816 to 393,821. Bela Gaspar.

Manufacture of thiazoles by reacting simultaneously an acidamide having at least an hydrogen atom in the amido group, an halogen-oxocompound and phosphorous pentasulfide. No. 393,824. Otto Hromatka.

Light-sensitive photographic layer comprising a carbohydrate derivative and a light-sensitive substance uniformly distributed therein. No. 393,825. Fritz Jaffe.

Fast-dyeing process comprising applying to the fabric an alkali metal salt of a sulfonic acid. No. 393,827. Konrad Renn.

Reduction of iron oxides in a furnace wherein at least part of the limestone or burnt lime is replaced with a calcium ferrite produced by sintering iron ore with limestone. No. 393,828. Ole Rolfsen.

Omni-laterally stretchable paper. No. 393,829. Gottfried Ruegenberg.

Condensing a thiazole hydrochloride with a compound selected from the group: 2-alkyl-6-amino-5-alkoxy-methyl-pyrimidine hydrochloride and 2-alkyl-6-amino-5-hydroxy-methyl-pyrimidine hydrochloride. No. 393,831. Otto Zima.

ENGLISH COMPLETE SPECIFICATIONS

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Resin emulsions. No. 525,190. Röhm & Haas Co.

Web-drying apparatus. No. 525,985. T. McDowell, Ltd.

Purification treatment of olefinic hydrocarbons. No. 525,986. Universal Oil Products Co.

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Manufacture of resinous dyestuffs and intermediates therefor. No. 525,996. Kodak, Ltd.

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Processes for the esterifaction of cellulose. No. 525,265. Standard Telephones & Cables, Ltd.

Synthetic milk. No. 525,003. J. Lowe Food Products Co., Ltd.

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Sugar refining. No. 525,014. Applied Sugar Laboratories, Inc.

Injection-molding of synthetic materials. No. 525,023. Ebonestos Industries, Ltd.

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Production of a sweetening agent. No. 525,031. I. Kreidl.

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Manufacture of a sulfur dyestuff. No. 525,039. I. G. Farbenindustrie A. G.

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